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**Compilation and Analysis of State Regulations for
SO₂, NO_X, Opacity, Continuous Monitoring and
Applicable Test Methods. Stationary Source
Enforcement Series, Volume I**

Engineering-Science, Inc., McLean, VA

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Air Enforcement

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**Compilation and
Analysis of State
Regulations for SO₂,
NO_x, Opacity,
Continuous Monitoring,
and Applicable
Test Methods**

**Stationary Source
Enforcement Series**

Volume I

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16. ABSTRACT Current copies of the air pollution control regulations of all fifty states, three territories, and twelve local agencies were reviewed for the purpose of compiling information on emission standards, compliance test methods, and continuous emission monitoring, as applied to existing stationary sources. Specific pollutants of interest were opacity, SO₂, NO_x, and sulfur compounds other than SO₂. The intent of this review was to identify the assortment of types, formats, and exemptions which prevail in existing SIP regulations for selected sources and pollutants, thereby providing guidance to EPA for writing future continuous emission monitoring regulations. This report is <u>not</u> to be used as an all inclusive reference document for such information. The primary focus of this review and compilation was the following existing source categories: continued on next page		
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COMPILATION AND ANALYSIS OF
STATE REGULATIONS FOR
SO₂, NO_x, OPACITY, CONTINUOUS MONITORING
AND APPLICABLE TEST METHODS

VOLUME I

EPA CONTRACT NO. 68-01-4146

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Presented to

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FOREWORD

This research was performed for the Division of Stationary Source Enforcement (DSSE), Environmental Protection Agency under Task Order No. 40, EPA Contract No. 68-01-4146. Mr. Howard Wright, Compliance Monitoring branch, Division of Stationary Source Enforcement was the EPA Task Manager.

Because this document is a product of the efforts of many individuals, it is impossible to acknowledge each person who has contributed. However, special recognition is given to the fifty states, three territories, and twelve local agencies who provided the information that served as the foundation of this research.

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SECTION I

INTRODUCTION

On October 6, 1975 Federal regulations were promulgated which required new and modified facilities within certain stationary source categories to install, operate, and maintain continuous emission monitoring systems. At that same time individual states were given a mandate to adopt minimum emission monitoring requirements for specified existing stationary sources by incorporating continuous monitoring (CM) provisions within their respective State Implementation Plans (SIP) by no later than October 6, 1976. To date some states have yet to respond by inclusion of the necessary monitoring requirements within their SIPs. Of the states which have drafted and proposed provisions for continuous monitoring of existing sources, the CM regulations have differed substantially in form, applicability, and enforceability.

The Division of Stationary Source Enforcement (DSSE) has engaged Engineering-Science (ES) to develop a document that summarizes the subject state CM regulations which have been proposed throughout the nation. In addition to this review of state CM regulations for existing sources, ES concurrently compiled all of the various state emission standards for opacity, SO₂, NO_x, and sulfur compounds other than SO₂ as currently in effect for existing stationary sources within each state. Finally, when a state regulation or supplemental guideline document was found to designate specific source test procedures for determination of compliance, the compliance test method of that particular state was noted during the regulations review.

This report is presented in three parts: Volume I, which presents the overall summary of the state regulations for continuous monitoring and emissions limitations for existing sources; Volume II, which consists of summary tabulations, by state, of the particular existing source groups regulated by an emission standard for opacity, SO₂, NO_x, and other sulfur compounds; Volume III, which contains the excerpts from each applicable agency regulation cited pertinent to emission standards, continuous monitoring, and compliance test methods for existing stationary sources.

BACKGROUND

Current copies of air pollution control regulations were solicited and received by ES during the period February-March, 1978 for each of the fifty state agencies, the District of Columbia, Puerto Rico, the Virgin Islands, and twelve local agencies selected in concert with the Task Manager.⁽¹⁾ Each agency's regulations were subsequently reviewed to develop a compilation consisting of (1) emission standards for opacity, SO₂, NO_x, and other sulfur compounds, and of (2) continuous emission monitoring requirements, as applied by that agency to existing sources. The Addendum to Volume I provides a concise, one-page summary for a given state therein identifying what existing source groups are subject to emission standards and which of those facilities are required to conduct continuous monitoring.

Soon after this project began, it was recognized that identification of the SIP-approved regulations (i.e., proposed by agency and approved by EPA for inclusion within a SIP) could require extensive contacts with both EPA and state agency personnel. The initial approach of using EPA's SIP file for regulation identification had proven cumbersome and time-consuming. Thus, the regulations herein compiled are those as provided by the particular agencies. In some cases parts of those regulations are at a stage of being only agency-adopted at this time, while in other instances the regulations have not only been adopted but also approved as part of an agency's SIP. In either case there is a high degree of confidence that the regulations, as received and reviewed, are "current." Several agency regulations were suspect from the standpoint that the minimal CM regulations received could possibly have been expanded but not included within the regulations provided to ES. In each case a follow-up contact with those agencies revealed that no additional CM regulations had been drafted and proposed by the agencies in question. Given the dynamic nature of the regulatory process, it is recognized that new and modified regulations are continually being developed, drafted, proposed and approved. For that reason the "current" status of some of the regulations cited herein is undoubtedly certain to be short-lived.

(1) Local agencies: Allegheny County (PA), Bay Area (CA) APCD, Boston, Chicago, Dade County (FL), Denver, Jefferson County (KY), Philadelphia, Puget Sound (WA), St. Louis, South Coast (CA) AQMD, Wayne County (MI).

SECTION II

STATE-ADOPTED EMISSION STANDARDS FOR EXISTING STATIONARY SOURCES

A major area of interest to this project was the identification and compilation of each agency's emission standards for existing sources for the following pollutants:

- o opacity (or visible emissions)
- o sulfur dioxide (SO₂)
- o nitrogen oxides (NO_x)
- o sulfur compounds other than SO₂ (eg. H₂SO₄ and TRS)

A comprehensive state-by-state listing of each existing source group regulated by emission standards for one or more of the above pollutants is tabulated in Volume II of this report. As shown in Volume II, the range of source categories affected by emission limitations is quite widespread from "all existing facilities" to "pilot plants". Within a given state one pollutant may have as many as ten emission standards for ten individual types of existing facilities while another pollutant may have no emission limitations for existing sources. A particular state having extensive emission standards for a given pollutant may be geographically adjacent to a state having no emission limitations for that same pollutant. The variety of existing sources covered by emission standards, coupled with the different ways of expressing those standards, is quite broad.

From this conceptual three-dimensional matrix of states, source categories, and emission standards, DSSE personnel have identified the following existing source categories and associated pollutants for which details of the applicable emission standards are of prime and immediate concern:

OPACITY

- o Fossil fuel-fired steam generators (FFSG)
- o Portland cement plants
- o Catalyst regenerators of fluid bed catalytic cracking units (FBCCU)
- o Hog fuel-fired boilers
- o Kraft recovery furnaces
- o Basic oxygen process furnaces (BOPF)
- o Ferroalloy electric submerged arc furnaces

SO₂

- o FFFSG
- o Sulfuric acid plants
- o Smelters

NO_x

- o FFFSG
- o Nitric acid plants

The remainder of this section discusses the types and extent of emission standards for each of the pollutant/source category groupings identified above.

OPACITY

The structures of most agency regulations for visible emissions are general in wording but broad in terms of areas of applicability. Although most of the agencies have identified at least a few specific source categories for which particular opacity standards have been written, in almost all cases an agency's regulations include an emission limitation on visible emissions which applies to practically everything that might be considered a stationary source. The most commonplace form of this wide-coverage opacity standard is the use of the general source grouping termed "all existing sources". Other frequently used terminologies assuring widespread applicability of a single opacity standard include "existing equipment", "existing facilities", "stationary sources", "process operations", and "existing installations." The end result of this generalized phraseology for visible emissions standards is obvious. Although an agency's regulations on visible emissions may be few in number, the total number of facilities affected may be quite large whenever the agency has adopted an opacity standard for "all existing sources."

This practice of using "all existing sources" in applying emission standards for pollutants is commonplace, especially so for opacity. Although a preliminary review of a state's emission standards for opacity may indicate that few specific source categories are actually covered, the presence of an all-inclusive opacity standard means otherwise. This fact must always be considered in attempting to quantify the number of agencies that have an opacity standard for a particular source group. To those agencies having

an opacity standard for the source type in question, one must add the agencies lacking that source-specific standard but having the all-encompassing regulation pertinent to "all existing facilities."

"All Existing Sources"

Table II-1 illustrates the range of visible emission standards employed by state and local agencies to govern the vast majority of existing sources. Particularly noteworthy is the fact that the District of Columbia is the only agency to completely prohibit visible emissions from all stationary sources. As evidenced by Table II-1, the agencies are rather evenly divided between an emission limitation for existing sources of 20% opacity (Ringelmann #1) and a standard of 40% opacity (Ringelmann #2). The states of Missouri, Montana, Tennessee, and Vermont actually use both opacity standards for existing sources, i.e., one set of specified sources must emit no greater than 20% opacity, while a second group of sources are permitted emissions up to 40% opacity. Conspicuous by their absence in Table II-1 are the state agencies of New Hampshire and New Jersey. These two states along with the Boston local agency are the only agencies which do not have some type of broad-scope opacity standard for existing sources. The seven agencies identified by an asterisk in Table II-1 are unique because their visible emission standards for this generalized, non-specific source category are expressed solely in units of the Ringelmann scale.

Most of the state and local agencies will allow visible emissions to exceed their standard for some finite period of time. As shown in Table II-2, only nine states and one local have opacity standards for all existing sources without an exception period. Of the agencies that do provide for intermittent excursions above the standard, the usual period allowed for emissions higher than the standard is between three to five minutes per hour. A few agencies allow the visible emissions to remain above the standard for six or eight minutes per hour. (It is these periods that must be accounted for in determinations of excess visible emissions. Opacities exceeding the standard, but for a time period not greater than the allowable exception, are not considered as excess visible emissions.) On one extreme of the allowable

TABLE II-1

VARIATION IN VISIBLE EMISSIONS STANDARDS FOR "ALL EXISTING SOURCES"
i.e., NON-SPECIFIC SOURCE CATEGORY

OPACITY STANDARD	STATES WHICH USE	LOCALS WHICH USE
0%	Maryland, District of Columbia	-
10%	-	-
20%	Alabama, Alaska, California, Colorado, Connecticut, Delaware, Florida, Louisiana, Maryland, Massachusetts*, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Mexico*, New York, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Dakota, Tennessee, Vermont, Virginia, Washington, West Virginia*, Puerto Rico	Allegheny Co., Bay Area APCD, Denver, Jefferson Co., Philadelphia*, Puget Sound*, South Coast AQMD
30%	Illinois, Texas	Chicago, Wayne Co.
40%	Arizona, Arkansas, Georgia, Hawaii, Idaho, Indiana, Iowa, Kansas, Kentucky, Maine, Mississippi, Missouri, Montana, North Carolina, North Dakota, Oregon, South Carolina*, Tennessee, Utah, Vermont, Wisconsin, Wyoming, Virgin Islands	Dade Co.,* St. Louis
**	New Hampshire, New Jersey	Boston

* Standard written only in units of Ringelmann Scale.

** No visible emissions standard for "All Existing Sources".

TABLE II-2

ALLOWABLE EXCEPTIONS TO VISIBLE EMISSION STANDARDS FOR "ALL EXISTING SOURCES"

i.e., NON-SPECIFIC SOURCE CATEGORY

MINUTES/HOUR PERMITTED TO EXCEED STANDARD							
NONE	TWO	THREE	FOUR	FIVE	SIX	EIGHT	
Arizona	(2) New Mexico	Alabama	Louisiana	Arkansas	Georgia (1)	Illinois	
Florida	(3) Washington	Alaska	Maryland	Connecticut	Massachusetts	Puerto Rico (4)	
Iowa	District of Columbia	California	Minnesota	Maine	Missouri	Chicago (4)	
Kansas		Colorado	Montana	North Carolina	Vermont		
Kentucky		Delaware	North Dakota	Oklahoma	Virgin Islands		
Nebraska		Hawaii		South Carolina	St. Louis		
Utah		Idaho		Tennessee	Wayne Co. (5)		
Virginia		Michigan		Texas			
Wyoming		Nevada		West Virginia			
Jefferson Co.		New York		Wisconsin			
		Ohio					
		Oregon					
		Pennsylvania					
		Rhode Island					
		South Dakota					
		Allegheny Co.					
		Bay Area APCD					
		Dade Co.					
(1) 3 min/30 min		Denver					
(2) 1 min/30 min		Philadelphia					
(3) 15 min/8 hr		Puget Sound					
(4) 4 min/30 min							
(5) 3 min/30 min							
		South Coast AQMD					

exceptions, Mississippi (not shown in Table II-2) permits visible emissions from all existing sources to exceed the standard for up to 15 minutes per hour. On the other hand, Indiana (not shown in Table II-2) permits opacities above the standard, but only for a period of 15 minutes per day. This latter method of expressing the allowable exception points out another characteristic common to many of the visible emissions standards. Although a large percentage of agencies do allow the standard to be exceeded intermittently, many of those same agencies also specify the number of times the opacity can be higher than the standard. This restriction is most frequently written to define the total minutes in a day that the standard may be exceeded.

The other feature of visible emissions standards that is sometimes used by those agencies which permit exceptions is the maximum allowable opacity during an excursion when the standard itself is exceeded. For the agencies which prescribe a ceiling on the maximum opacity, that restriction ranges from 20% to 40% above the opacity standard. In the case of Wisconsin, for example, this article means that opacities of up to 80% for five minutes per hour are allowable. Conversely, some states which utilize an exception period to the visible emissions standard do not place an upper limit on the opacity when the standard is exceeded. Thus, in the case of Delaware, for example, the emissions exceeding the 20% standard could technically be at 100% opacity during three minutes per hour.

Table II-3 is a tabulation of the salient features of each agency's visible emissions standard for the "all existing sources" category. In addition to the entries for opacity standard, allowable periods of exception, and maximum opacities during excursion above standard, the last column of that table cites the specific terminology used by each state or local for its all-inclusive opacity standard. As the remainder of this section demonstrates, because the actual number of source category-specific standards for opacity are so few, the existence of this generalized category standard has wide-reaching effects upon those categories of prime interest to DSSE.

TABLE II-3
AGENCY-APPROVED VISIBLE EMISSIONS STANDARDS
FOR "ALL EXISTING SOURCES," i.e., NOT SOURCE SPECIFIC

STATE	OPACITY	RINGELMANN	EXCEPTIONS	NAME OF SOURCE CITED
Alabama	20%	#1	#1-#3 min/hr	Stationary Sources
Alaska	20%	-	>20%, 3 min/hr	Industrial Processes
Arizona	40%	#2	-	All Sources
Arkansas	Equiv. #2	#2	#2-#3, 5 min/hr 3 times/day	Existing Equip.
California	20%	-	>20%, 3 min/hr	All
Colorado	20%	-	20%-40%, 3 min/hr	Sta. Air Contam. Sources
Connecticut	20%	#1	<40% or #2, 5 min/hr	Process Sources & All Sources
Delaware	20%	#1	>20%, 3 min/hr & 15 min/24 hr	All Sources
Florida	20%	#1	-	All Sources Not Otherwise Covered
Georgia	Equiv. #2	#2	#2-#3, 3 min/hr	All Facilities
Hawaii	40%	#2	#2-#3, 3 min/hr	Existing Sources
Idaho	40%	#2	>#2, 3 min/hr	Existing Sources
Illinois	30%	-	30%-60%, 8 min/ hr, 3 times/day	All Other Emission Sources
Indiana	40%	#2	>40%, 15 min/day	All Sources
Iowa	40%	#2	-	All
Kansas	40%	-	-	Processing of Materials
Kentucky	40%	-	-	Process Operations
Louisiana	20%	-	>20%, 4 min/hr	All Sources
Maine	40%	#2	>40% for 5 min/ hr or 15 min/ cont. 3 hrs	All Sources
Maryland	0% or 20%	0 or #1	<40%, 4 min/hr	Existing Installation
Massachusetts	-	#1	<#2, 6 min/hr	Stationary Source Other than Incin..
Michigan	20%	#1	20%-40%, 3 min/ hr, 3 times/ day	All Sources
Minnesota	20%	-	20%-40%, 4 min/ hr & 40%-60%, 4 min/hr	Industrial Process Equipment
	20%	-	20%-40%, 4 min/ hr	Existing Facilities, N. O. Regulated
Mississippi	40%	#2	>#2, 15 min/hr 3 times/day	All Sources
Missouri	Equiv. #1 or #2	#1 or #2	#1-#2, #1-#3, #2-#3, for 6 min/hr (varies within state)	All Sources
Montana	Equiv. #1 or #2	#1 or #2	#1-#3 or #2-#3, 4 min/hr	All Installations & All Single Sources
Nebraska	20%	#1	-	All
Nevada	20%	-	>20%, 3 min/hr	All
New Hampshire	-	-	-	-
New Jersey	-	-	-	-
New Mexico	-	#1	>#1, 1 min/30 min	All Sources
New York	20%	-	>20%, 3 min/hr	Any Air Contamination Source
North Carolina	40%	#2	>40%, 5 min/hr, or 20 min/day	All Sources

TABLE II-3 (Continued)

AGENCY-APPROVED VISIBLE EMISSIONS STANDARDS
FOR "ALL EXISTING SOURCES," i.e., NOT SOURCE SPECIFIC

STATE	OPACITY	RINGELMANN	EXCEPTIONS	NAME OF SOURCE CITED
North Dakota	Equiv. #2	#2	#2-#3, 4 min/hr	Existing Installations
Ohio	20%	#1	20%-60%, 3 min/hr	All Single Sources
Oklahoma	20%	#1	20%-60%, 5 min/hr 20 min/day	All Sources
Oregon	40%	-	>40%, 3 min/hr	All Sources
Pennsylvania	20%	-	20%-60%, 3 min/hr	All
Rhode Island	20%	-	>20%, 3 min/hr	All
South Carolina	-	#2	#2-#3, 5 min/hr, or 20 min/day	All Sources
South Dakota	20%	#1	20%-60%, 3 min/hr	All Sources
Tennessee	20% or 40%	#1 or #2	>20% or >40%, 5 min/hr, 20 min/ day	All Air Contam. Sources & "Certain Existing Sources"
Texas	30% (5 min ave.)	-	>30%, 5 min/hr 6 hr/10 days	Stationary Flue
Utah	40%	#2	-	All Existing Single Sources
Vermont	20% or 40%	-	>20% or >40%, 6 min/hr; always <60%	Installations
Virginia	20%	-	-	All Sources
Washington	20%	-	>20%, 15 min/ 8 hr	All Sources
West Virginia	-	#1	#1-#3, 5 min/hr	All
Wisconsin	40%	#2	40%-80%, 5 min/ hr, 3 times/day	All Sources Before 4/1/72
Wyoming	40%	-	-	All Existing Sources
D. C.	0%	-	0-20%, 2 min/hr 12 min/day	All Sources (>100 TPY)
Puerto Rico	20%	#1	20%-60%, 4 min/ 30 min	Stationary Sources
Virgin Islands	Equiv. #2	#2	>#2, 6 min/hr	All Existing Single Sources
Allegheny Co.	Equiv. #1	#1	#1-#3, 3 min/hr	All Sources
Bay Area APCD	Equiv. #1	#1	>#1, 3 min/hr	All Sources
Boston	-	-	-	-
Chicago	Equiv. #1.5	#1.5	#1.5-#2, 4 min/ 30 min; #1.5- #3, 4 min/hr- soot blowing, etc.	All Sources
Dade Co.	-	#2	>#2, 3 min/hr	All Sources
Denver	20%	-	>20%, 3 min/hr	All Sources
Jefferson Co.	20%	-	-	Process Operations
Philadelphia	-	#1	#1-#3, 3 min/hr	All Sources (Except Incin.)
Puget Sound	-	#1	>#1, 3 min/hr	All Sources
St. Louis	Equiv. #2	#2	>#2, 6 min/hr	Existing Single Sources
South Coast AQMD	Equiv. #1	#1	>#1, 3 min/hr	Single Source of Emission
Wayne Co.	30%	#1.5	>3-#, 3 min/30 min	All Sources

Fossil Fuel-Fired Steam Generators (FFFSG)

With the possible exception of incineration, the source category of FFFSG, or some variant thereof, is the most regulated facility among the state and local agencies' emission standards for visible emissions. However, the exact terminology of "fossil fuel-fired steam generators" is used infrequently in agency standards for visible emissions from existing sources. More commonplace source descriptions consist of the following:

- o fuel-burning equipment
- o indirect heating equipment
- o indirect heat exchangers
- o combustion units or combustion installations

Florida is the only agency for which a visible emissions standard is specifically written for existing FFFSG. However, because in each case FFFSG is an element within a larger set of sources defined by the above source category descriptions, visible emissions standards as written for those more encompassing source categories have been interpreted to apply specifically to existing FFFSG.

As shown in Table II-4, only 13 states and three locals have specific opacity standards applicable to FFFSG. Of those agency standards the most predominant opacity limitation is 20%. As in the case of visible emissions standards for "All Existing Sources", Kentucky again has one set of "indirect heat exchangers" subject to the 20% limitation and a second group within that same category allowed to emit up to the 40% opacity level. Recognizing that FFFSG would be included within the larger category of "All Existing Sources", the states and locals identified in Table II-4 would have to be combined with those agencies in Table II-1 in order to characterize the total number of agencies within which opacity limitations on FFFSG are applicable. In doing this exercise, visible emissions from existing FFFSG are found to be covered by some form of emission standard for all of the 65 agency regulations reviewed.

Table II-5 is a tabular listing of the states and locals with visible emissions standards for existing FFFSG. In addition to the standards, the

TABLE II-4

VARIATION IN VISIBLE EMISSIONS STANDARDS FOR
EXISTING FOSSIL FUEL-FIRED STEAM GENERATORS (FFSG)

OPACITY STANDARD	STATES WHICH USE	LOCALS WHICH USE
0%	-	-
10%	-	-
20%	Alaska, Connecticut, Delaware, Florida, Kentucky, Louisiana, * Massachusetts, Minnesota, New Hampshire, New Jersey, New York	Bay Area APCD, Jeffer- son County
30%	Arizona, Kansas, Kentucky	** Boston
40%		

* Standard specified only in units of Ringelmann.

** #2 on ASTM Smoke Scale.

TABLE II-5

STATE-APPROVED VISIBLE EMISSIONS STANDARDS
FOR EXISTING FOSSIL FUEL-FIRED STEAM GENERATORS

STATE	OPACITY	RINGELMANN	EXCEPTIONS	NAME OF SOURCE CITED
Alaska	20%	-	>20%, 3 min/hr	Fuel Burning Equip.
Arizona	40%	-	>40%, 10 consec. sec.	Fuel Burning Equip.
Connecticut	20%	#1	<40% or #2, 5 min/hr	Fuel Burning Equip.
Delaware	20%	-	>20% but <40%, 2 min/hr	Fuel Burning Equip.
Florida	20%	#1	#1-#2, 2 min/hr	FFFSG
Indiana	-	-	40%-60%, 10 min/ day-fire starting 40%-60%, 5 min/ hr, 6 times/day- soot blowing	All Sources
Kansas	40%	-	-	Indirect Heating Equip.
Kentucky	20% & 40%	-	20%-40%, or 40%-60%, 2-6 min/hr	Indirect Heat Exchangers
Louisiana	Equiv. #1	#1	>#1, 4 min/hr	Combustion Unit
Massachusetts	-	#1	< #2, 6 min/hr	Fossil Fuel Utiliza- tion Facility
Minnesota	20%	-	20%-40%, 4 min/hr 40%-60%, 4 min/hr	Indirect Heating Equip.
Mississippi	-	-	Up to #3, 10 min/ 10 ⁶ Btu/day-soot blowing	All Sources
New Hampshire	20%	-	<40%, 2 min/hr	Steam Generators
New Jersey	20%	-	-	Indirect Heat Ex- changers
New York	20%	#1	>20% but <40%, 3 min/hr	Stationary Combustion Installations
Bay Area APCD	Equiv. #1	#1	>#1, 3 min/hr #1-#3, 6 min/ day/10 ⁶ Btu- soot blowing	Heat Transfer Operations
Boston	-	#2	On std. smoke scale (ASTM)	Fuel Burning Equip- ment
Jefferson Co.	20%	-	20%-40%, 10 min/ 60 min, 20%-80% depending on type, start-up	Indirect Heat Exchangers

allowable periods of exceptions exceeding the standards and the particular source category terminology used by each state are also indicated. Although the states of Indiana and Mississippi have no specific standard for FFFSG, these agencies do cite particular exceptions in the cases of fire starting and/or soot blowing. Because these operations are characteristic of FFFSG, those two agencies have been included in Table II-5.

Portland Cement Plants

Of the agencies reviewed, only four states have opacity standards specifically for existing portland cement plants. The details of those particular regulations are shown below.

TABLE II-6

STATE-APPROVED VISIBLE EMISSIONS STANDARDS FOR EXISTING PORTLAND CEMENT PLANTS

<u>STATE</u>	<u>OPACITY</u>	<u>RINGELMANN</u>	<u>EXCEPTIONS</u>
Arizona	10%/20%	-	kiln/clinker cooler; Phoenix-Tuscon AQCR only
Georgia	10%	#1/2	
Minnesota	20%	-	20%-40%, 4 min/30 min 40%-60%, 4 min/hr
New York	20%	#1	>20%, 3 min/hr

None of the local agencies have particular opacity standards for this source category. Other state and local agencies with opacity standards applicable to portland cement plants consist of those identified previously under "All Existing Sources."

FBCCU Catalyst Regenerators

Similar to the conditions for portland cement plants, only four states have visible emissions standards for existing FBCCU catalyst regenerators. Those states and their appropriate emission standards are identified in the following table.

TABLE II-7

STATE-APPROVED VISIBLE EMISSIONS STANDARDS
FOR EXISTING FBCCU CATALYST REGENERATORS

<u>STATE</u>	<u>OPACITY</u>	<u>RINGELMANN</u>	<u>EXCEPTIONS</u>
Louisiana*	30%	-	>30%, 3 min/hr
Minnesota	30%	-	>30%, 3 min/hr
New Mexico	40%	-	40%-60%, 15 min/day
Washington	40%	-	>40%, 3 min/hr

* Listed as FCCU Incinerator - Waste Heat Boiler

None of the local agencies have particular opacity standards for this source category. Other state and local agencies with opacity standards applicable to existing FBCCU catalyst regenerators consist of those identified previously under "All Existing Sources."

Hog Fuel-Fired Boilers

The situation for existing hog fuel-fired boilers being specifically identified as such in state/local agency regulations is similar to the applicability of regulations for FFFSG. Washington is the only agency with an opacity standard specifically directed at "hog fuel boilers". Whereas Florida was the only agency with an opacity standard specific to FFFSG, Florida also has a visible emissions standard for "carbonaceous fuel burning equipment." The remainder of state and local emission standards directly applicable to visible emissions from hog fuel-fired boilers results from those agency terminologies such as "fuel-burning equipment", "indirect heat exchangers", etc. It should be noted that the source categories named in several agency regulations as "wood waste burners" and "wood residue burners" are facilities such as teepee or wigwam burners and are associated with incineration instead of hog fuel-fired boilers.

Table II-8 is a tabulation of the 12 state and three local agencies with visible emissions limitations directly applicable to hog fuel-fired

TABLE II-8

AGENCY-APPROVED VISIBLE EMISSIONS STANDARDS
FOR EXISTING HOG FUEL-FIRED BOILERS

STATE	OPACITY	RINGELMANN	EXCEPTIONS	NAME OF SOURCE CITED
Alaska	20%	-	>20%, 3 min/hr	Fuel Burning Equipment
Arizona	40%	-	>40%, 10 cons. sec.	Fuel Burning Equipment
Connecticut	20%	#1	20%-40%, 5 min/hr	Fuel Burning Equipment (Solid)
Delaware	20%	-	20%-40%, 2 min/hr	Fuel Burning Equipment
Florida	30%	#1.5	30%-40%, 2 min/hr	Carbonaceous Fuel Burning Equipment
Indiana	-	-	40%-60%, 10 min/day-fire starting 40%-60%, 5 min/hr, 6 times/day-soot blowing	All Sources
Kansas	40%	-	-	Indirect Heating Equipment
Kentucky	20% &	-	20%-40%, or 40%-60%, 2-6 min/hr	Indirect Heat Exchangers
Louisiana	Equiv. #1	#1	>#1, 4 min/hr	Combustion Unit
Minnesota	20%	-	20%-40%, 4 min/hr, 40%-60%, 4 min/hr	Indirect Heating Equipment
Mississippi	-	-	$\leq$ #3, 10 min/10 ⁹ Btu/day-soot blowing	All Sources
New Hampshire	-	#2	>#2, 6 min/60 min-soot blowing, etc.	Fuel Burning Equipment
New Jersey	20%	-	-	Indirect Heat Exchangers
New York	20%	#1	20%-40%, 3 min/hr	Stationary Combustion Installations
Washington	20%	-	>20%, 15 min/4 hr	Hog Fuel Boilers
Bay Area APCD	Equiv. #1	#1	>#1, 3 min/hr #1-#3, 6 min/day/10 ⁹ Btu-soot blowing	Heat Transfer Operations
Boston	-	#2	ASTM smoke scale	Fuel Burning Equipment
Jefferson Co.	20%	-	20%-40%, 10 min/hr, 20%-30%, depending on type and start-up	Indirect Heat Exchangers

boilers. Other state and local agencies with opacity standards that can be related to hog fuel-fired boilers consist of those identified previously under "All Existing Sources."

Kraft Recovery Furnaces

Visible emissions limitations on existing kraft recovery furnaces are specifically promulgated as such only by the State of Washington. The emission standard prescribed for that group of existing facilities is 35% opacity. Visible emissions exceeding that standard are allowed for six minutes per hour. Other state and local agencies with opacity standards applicable to kraft recovery furnaces consist of those identified previously under "All Existing Sources."

Basic Oxygen Process Furnaces (BOPF)

None of the state and local agency regulations reviewed contain a specific provision related to visible emissions standards for existing BOPF. However, existing BOPF visible emissions are subject to regulation when operating within a state or local jurisdiction having a visible emissions standard previously identified under "All Existing Sources."

Ferroalloy Electric Submerged Arc Furnaces

There are no state or local agency regulations with specific opacity provisions for existing ferroalloy production facilities. However, this group of existing facilities is still subject to more general opacity standards of the type for "All Existing Sources" as previously identified.

SULFUR DIOXIDE (SO₂)

Although not nearly as prevalent as with opacity standards for existing sources, the practice of using a non-specific source category description for existing facilities subject to gaseous emission standards is rather commonplace. Of the different gaseous emission standards, the SO₂ limitation for existing sources is most often found to apply to the "All Existing Sources" grouping. In addition to the collective phrases such as "existing equipment", "existing facilities", etc., other terminologies such as "industrial process

operations" and "manufacturing equipment" are frequently employed as the subject source group for a generalized SO emission standard applicable to a host of industrial activities.

Fossil Fuel-Fired Steam Generators (FFFSG)

As shown in Table II-9, state and local agencies use a total of four different ways to prescribe SO₂ emission standards for existing FFFSG. It should be reiterated that many of the agencies do not specifically name existing FFFSG as the affected facility to which the SO₂ emission limitation applies. More often than not, the source grouping subject to the standard is designated as "fuel burning equipment", "indirect heating equipment", "combustion units", etc., in a manner identical to opacity standards for existing FFFSG as previously discussed. Once again, the extrapolation of those standards to a summary such as Table II-9 is valid since in all cases FFFSG is an element of the larger, more general source group to which the standard is directed.

Table II-9 clearly demonstrates that an emission standard based upon FFFSG heat input and an emission standard restricting the amount of sulfur in the fuel are the most widely used means of specifying SO₂ emission limitations for this source category. Of the 65 agencies' regulations reviewed, 36 agencies specify a lb/10⁶Btu standard and 28 agencies define the allowable fuel sulfur content. Concentration of SO₂ emissions in ppm is the method employed by 11 different agencies, while four agencies designate a maximum allowable mass emission rate of SO₂ in lb/hr. The total number of agencies specifying an SO₂ emission standard in one of these four ways is greater than the number of agency regulations reviewed because some agencies use more than one set of units to define the SO₂ emission standard. Michigan, for example, has the SO₂ emission limitation for existing FFFSG expressed in terms of lb/10⁶Btu and ppm as well as a specification for the allowable fuel sulfur content. On the other hand, the states of Arkansas, Maine and Rhode Island have no SO₂ emission standard applicable to existing FFFSG.

Sulfuric Acid Plants

Table II-10 shows the two principal types of SO₂ emission standards for sulfuric acid plants - ppm SO₂ and lb SO₂/ton acid produced. The agencies

TABLE II-9

TYPES OF SO₂ EMISSION STANDARDS USED BY STATE AND
LOCAL AGENCIES FOR EXISTING FOSSIL FUEL-FIRED STEAM GENERATORS (FFFG)

1b SO ₂ /10 ⁶ Btu	FUEL SULFUR CONTENT, wt. % S	1b SO ₂ /hour	ppm, as SO ₂
Alabama, Arizona, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, West Virginia, Wisconsin, Wyoming	California, Connecticut, Georgia, Hawaii, Idaho, Maryland, Massachusetts, ¹ Michigan, Missouri, Montana, New Hampshire, ¹ New Jersey, New York, Oregon, Utah, Vermont, West Virginia, District of Columbia, Puerto Rico, Virgin Islands	California, Georgia, [*] Nevada, ² Virginia	Alaska, [*] Colorado, [*] Louisiana, [*] Michigan, New Jersey, [*] Texas, Washington
Allegheny County, Dade County, Jefferson County, Philadelphia, South Coast AQMD	Bay Area APCD, Boston, Chicago, Philadelphia, Puget Sound, St. Louis, South Coast AQMD, Wayne County		Bay Area APCD, Denver, [*] Puget Sound, St. Louis

* Emission standard is not directly source-related, but is in the form used for "All Existing Sources"

¹Expressed as 1b S/10⁶Btu

²Expressed as 1b S/hour

Agencies With NO Applicable SO₂ Emission Standard for FFGG:

o Arkansas o Maine o Rhode Island

TABLE II-10

TYPES OF SO₂ EMISSION STANDARDS USED BY STATE AND
LOCAL AGENCIES FOR EXISTING SULFURIC ACID PLANTS

lb SO ₂ /ton of 100% acid	ppm, as SO ₂	MISCELLANEOUS
Alabama, Connecticut, Florida, Georgia, Idaho, Iowa, Kentucky, Massachusetts, Minnesota, New Hampshire, New York, North Carolina, Ohio, Oklahoma, South Carolina, Virginia, West Virginia, Wisconsin, Puerto Rico	Alaska, * California, * Colorado, * Delaware, Illinois, * Louisiana, Maryland, * Mississippi, * Mis- souri, * Nevada, * ¹ New Jersey, * Pennsylvania, * Tennessee, * Texas, Virginia, Washington, * Wyoming, District of Columbia * ²	Arizona - 10% of S in feed; * ³ Indiana, * Missouri, * Nevada, Texas - 1b SO ₂ /hr; New Mexico - 1b S/100 lb S in feed.
Allegheny County, Wayne County	Bay Area APCD, * Chicago, * Denver, * Jefferson County, * South Coast AQMD	South Coast AQMD - 1b SO ₂ /hr

* Emission standard is not directly source-related, but is in the form used for "All Existing Sources"

¹ Expressed in ppm, as S

² Expressed in volume %, as SO₂

³ Expressed in lb/hr, as S

identified by an asterisk are those which do not prescribe the SO₂ emission standard specifically for sulfuric acid plants. Those agencies' standards are directed toward SO₂ emissions from a larger grouping of source categories which includes sulfuric acid plants.

In all, 46 different agencies have SO₂ emission standards applicable to sulfuric acid plants. Of those 46 agencies, 19 states and two locals use lb SO₂/ton acid for an emission standard specifically for existing sulfuric acid plants. There are six agencies which use ppm SO₂ as the type of emission standard specifically for existing sulfuric acid plants. Virginia is unique in this summary because it employs both lb/ton acid and ppm for sulfuric acid plants. The remaining 20 agencies either have generalized, non-specific SO₂ emission standards or have adopted a different, less frequently used, basis for the SO₂ emission standard.

Non-Ferrous Smelters

The apparently large number of agencies using ppm as the units of SO₂ emission standards for existing non-ferrous smelters parallels the circumstances previously discussed for sulfuric acid plants. Several of the state and local agencies have generalized, non-specific SO₂ emission standards in ppm which include smelters in their scope of applicability. On the other hand, as indicated in Table II-11, the majority of SO₂ emission standards written specifically for existing non-ferrous smelters are expressed in terms of lb SO₂/hr. Considering only those regulations specifically addressing existing non-ferrous smelters, 12 agencies have adopted a lb/hr type of SO₂ emission standard, but only two agencies employ the ppm approach. The complex Idaho emission standard not only uses both lb/hr and ppm, but also specifies tons SO₂/day and tons SO₂/7-day period. Other western states (Arizona, New Mexico, and Utah) express their standards in units of pounds or tons of sulfur or percent of sulfur in the feed.

Table II-12 is a state-by-state tabulation of the units of SO₂ emission standards for the three major source categories previously discussed.

TABLE II-11

TYPES OF SO₂ EMISSION STANDARDS USED BY STATE AND LOCAL AGENCIES

FOR EXISTING NON-FERROUS (Cu, Pb, Zn) SMELTERS

lb SO ₂ /hour	ppm, as SO ₂	MISCELLANEOUS
Connecticut, Georgia, * Idaho (Pb & Zn), ¹ Indiana, * Kansas, Mississippi, Missouri, * Montana, Nevada (Cu), Nevada (Pb & Zn) ^{2,4} , New Hampshire, Ohio, Oklahoma, Virginia, West Virginia, Puerto Rico.	Alaska, * California, * Colorado, * Idaho (Pb & Zn), ¹ Illinois, * Iowa, * Kentucky, * Louisiana, * Maryland, * Massachusetts, * Missouri, * Nevada (Pb & Zn), ² New Jersey, * Pennsylvania, * Ten- nessee, * Texas, Washington, * District of Columbia ³	Arizona (Cu) - tons S/day; Arizona (Pb & Zn) * - 10% of S in feed New Mexico - 1b S/100 lb S in feed Utah - tons/mo or % of S in feed
- - - - -	- - - - -	- - - - -
- - - - -	Allegheny County, * Bay Area APCD, * Chicago, * Denver, * Jefferson County, * Wayne County*	- - - - -

* Emission standard is not directly source-related, but is in the form used for "All Existing Sources"

¹ Emission standard is a combination of lb/hr and ppm; also covers tons/day and tons/7-day period² Expressed in ppm, as S³ Expressed in volume %, as SO₂⁴ Expressed in lb/hr, as S

TABLE 11-12

UNITS OF AGENCY APPROVED SO₂ EMISSION STANDARDS

STATE	FFPS	SULFURIC ACID PLANTS		SMELTERS			
				Cu	Pb	Zn	
ALABAMA	lb/10 ⁶ Btu	lb/ton acid	ppm	ppm	ppm	ppm	
ALASKA	ppm	10% of S in feed	ppm	ppm	ppm	ppm	
ARIZONA	lb/10 ⁶ Btu		tons (as S) day				
ARKANSAS	-						
CALIFORNIA	lb/hr and Fuel S	ppm	ppm	ppm	ppm	ppm	
COLORADO	ppm	ppm	ppm	ppm	ppm	ppm	
CONNECTICUT	lb/10 ⁶ Btu and Fuel S	lb/ton acid	lb/hr	lb/hr	lb/hr	lb/hr	
DELAWARE	lb/10 ⁶ Btu	ppm	-	-	-	-	
FLORIDA	lb/10 ⁶ Btu	lb/ton acid	-	-	-	-	
GEORGIA	lb/hr, lb/10 ⁶ Btu and Fuel S	lb/ton acid	lb/hr	lb/hr	lb/hr	lb/hr	
HAWAII	Fuel S	-	-	-	-	-	
IDaho	Fuel S	lb/ton acid	-	-	lb/hr (1 hr. avg.) & tons/7-day period OR ppm and tpd	-	
ILLINOIS	lb/10 ⁶ Btu	ppm	ppm	ppm	ppm	ppm	
INDIANA	lb/10 ⁶ Btu	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	
IOWA	lb/10 ⁶ Btu (2 hr. avg.)	lb/ton acid (2 hr. avg.)	ppm	ppm	ppm	ppm	
KANSAS	lb/10 ⁶ Btu	-	-	-	lb/hr (new)	lb/hr (new)	
KENTUCKY	lb/10 ⁶ Btu	lb/ton acid	ppm	ppm	ppm	ppm	
LOUISIANA	ppm	ppm (3 hr. avg.)	ppm	ppm	ppm	ppm	
MAINE	-	-	-	-	-	-	
MARYLAND	Fuel S	ppm	ppm	ppm	ppm	ppm	
MASSACHUSETTS	Fuel S (lb S/10 ⁶ Btu)	lb/ton acid	ppm	ppm	ppm	ppm	
MICHIGAN	lb/10 ⁶ Btu, ppm, and Fuel S	-	-	-	-	-	
MINNESOTA	lb/10 ⁶ Btu	lb/ton acid	-	-	-	-	
MISSISSIPPI	lb/10 ⁶ Btu	ppm	lb/hr	lb/hr	lb/hr	lb/hr	
MISSOURI	lb/10 ⁶ Btu and Fuel S	ppm or lb/hr	ppm or lb/hr	ppm or lb/hr	ppm or lb/hr	ppm or lb/hr	
MONTANA	Fuel S	-	lb/hr	lb/hr	lb/hr	lb/hr	

TABLE 11-12 (CONTINUED)

UNITS OF AGENCY APPROVED SO₂ EMISSION STANDARDS

STATE	FFPSG	SULFURIC ACID PLANTS				SMelters			
NEBRASKA	1b/10 ⁶ Btu (2 hr. avg.)	-	-	-	-	-	-	-	-
NEVADA	1b/hr (as S)	1b/hr [*] and ppm [*] (as S)	1b/hr (6 hr. avg.)	1b/hr [*] and ppm [*] (as S)	-	-	-	-	-
NEW HAMPSHIRE	Fuel S (1b S/10 ⁶ Btu)	1b/ton acid	1b/hr	1b/hr	1b/hr	1b/hr	1b/hr	1b/hr	1b/hr
NEW JERSEY	Fuel S (2 S) and ppm	ppm [*]	ppm ^a	ppm ^a	ppm ^a	ppm ^a	ppm ^a	ppm ^a	ppm ^a
NEW MEXICO	1b/10 ⁶ Btu	-	-	-	-	-	-	-	-
NEW YORK	1b/10 ⁶ Btu and Fuel S	1b/ton acid	-	1b S/100 lb S in feed	-	-	-	-	-
NORTH CAROLINA	1b/10 ⁶ Btu	1b/ton acid	-	-	-	-	-	-	-
NORTH DAKOTA	1b/10 ⁶ Btu	-	-	-	-	-	-	-	-
OHIO	1b/10 ⁶ Btu	1b/ton acid	1b/hr	1b/hr	1b/hr	1b/hr	1b/hr	1b/hr	1b/hr
OKLAHOMA	1b/10 ⁶ Btu (new)	1b/ton acid (new)	1b/hr (new)	1b/hr (new)	1b/hr (new)	1b/hr (new)	1b/hr (new)	1b/hr (new)	1b/hr (new)
OREGON	Fuel S	-	-	-	-	-	-	-	-
PENNSYLVANIA	1b/10 ⁶ Btu	ppm [*]	ppm [*]	ppm [*]	ppm [*]	ppm [*]	ppm [*]	ppm [*]	ppm [*] (2 hr. avg.)
RHODE ISLAND	-	-	-	-	-	-	-	-	-
SOUTH CAROLINA	1b/10 ⁶ Btu	1b/ton acid	-	-	-	-	-	-	-
SOUTH DAKOTA	1b/10 ⁶ Btu	-	-	-	-	-	-	-	-
TENNESSEE	1b/10 ⁶ Btu (1 hr. avg.)	ppm [*]	ppm ^a	ppm ^a (one hour average)	ppm ^a	ppm ^a	ppm ^a	ppm ^a	ppm ^a
TEXAS	1b/10 ⁶ Btu and ppm	1b/hr and ppm	ppm (6 hr. avg.)	ppm (2 hr. avg.)	ppm (2 hr. avg.)	ppm (2 hr. avg.)	ppm (2 hr. avg.)	ppm (2 hr. avg.)	ppm (2 hr. avg.)
UTAH	Fuel S	-	-	-	-	-	-	-	-
VERMONT	1b/10 ⁶ Btu and Fuel S	-	-	-	-	-	-	-	-
VIRGINIA	1b/hr	ppm and 1b/ton acid	1b/hr	1b/hr	1b/hr	1b/hr	1b/hr	1b/hr	1b/hr
WASHINGTON	ppm [*]	ppm [*]	ppm [*]	ppm [*]	ppm [*]	ppm [*]	ppm [*]	ppm [*]	ppm [*]
WEST VIRGINIA	1b/10 ⁶ Btu and Fuel S	1b/ton acid	1b/hr	1b/hr	1b/hr	1b/hr	1b/hr	1b/hr	1b/hr
WISCONSIN	1b/10 ⁶ Btu (new)	1b/ton acid (new)	-	-	-	-	-	-	-
WYOMING	1b/10 ⁶ Btu	ppm (2 hr. avg.)	-	-	-	-	-	-	-

TABLE II-12 (CONTINUED)
UNITS OF AGENCY APPROVED SO₂ EMISSION STANDARDS

AGENCY	FFPSG	SULFURIC ACID PLANTS	SMELTERS		
			Cu	Pb	Zn
			Volume percent (ppm) *		
DIST. OF COL.	Fuel S	lb/ton acid	lb/hr	lb/hr	lb/hr
PUERTO RICO	Fuel S	-	-	-	-
VIRGIN ISLANDS	Fuel S	-	-	-	-
ALLEGHENY CO.	lb/10 ⁶ Btu	lb/ton acid	ppm *	ppm *	ppm *
BAY AREA APCD	ppm and Fuel S	ppm *	ppm *	ppm *	ppm *
BOSTON	Fuel S	-	-	-	-
CHICAGO	Fuel S	ppm *	ppm *	ppm *	ppm *
DADE CO.	lb/10 ⁶ Btu	-	-	-	-
DENVER	ppm *	ppm *	ppm *	ppm *	ppm *
JEFFERSON CO.	lb/10 ⁶ Btu	ppm *	ppm *	ppm *	ppm *
PHILADELPHIA	lb/10 ⁶ Btu and Fuel S	-	-	-	-
PUGET SOUND	ppm and Fuel S	-	-	-	-
ST. LOUIS	ppm and Fuel S	-	-	-	-
SOUTH COAST AQMD	lb/10 ⁶ Btu and Fuel S	lb/hr and ppm	-	-	-
WAYNE CO.	Fuel S	lb/ton acid	ppm *	ppm *	ppm *

* Emission standard not directly source-related, but in the form used for "All Existing Sources"

NITROGEN OXIDES

The lists of state and local agencies that currently have NO_x emission standards for existing FFFSG and/or existing nitric acid plants are tabulated in Table II-13. As is the case for opacity and SO₂ emissions from FFFSG, the NO_x emission standards applicable to this source group are usually applicable to a wider range of "fuel burning equipment." Of the 16 state agencies having a NO_x emission standard for existing FFFSG, all except one express their standards in units of lb NO_x/10⁶ Btu. Conversely, two of the three local agencies with NO_x emission standards applicable to existing FFFSG have specified the restriction in terms of ppm of NO_x.

Of the 18 states having a NO_x emission standard for existing nitric acid plants, all but two of those states have adopted a standard in units of lb NO_x/ton 100% acid produced. Texas specifically restricts NO_x emissions from existing nitric acid plants on a ppm basis. Massachusetts' generalized ppm emission standard for NO_x from "industrial facilities" is applicable to existing nitric acid plants. Nevada is unique in specifying the NO_x emission standard in terms of both sets of units, lb/ton acid and ppm.

Table II-14 is a state-by-state tabulation of the units of NO_x emission standards for each of the two major source categories previously discussed.

MALFUNCTIONS AND SCHEDULED MAINTENANCE

As previously illustrated, many of the agencies' visible emission standards are accompanied by a general exception provision whereby visible emissions in excess of the specific limitation are permissible, regardless of the particular cause, for a given period of time. The occurrences of unavoidable equipment breakdown and of deliberate control equipment shut-down for maintenance are two specific cases that many agencies recognize as reasons for waiving applicability of emission standards. Malfunctions, also referred to as breakdowns or upsets, can occur within the source

TABLE II-13

AGENCIES WITH NO_x EMISSION STANDARDS FOR SELECTED
EXISTING SOURCE CATEGORIES

FOSSIL FUEL-FIRED STEAMGENERATORS (FFSG)¹

California (lb/hr)
Connecticut
Delaware
Georgia
Illinois
Indiana
Maryland
Massachusetts
Minnesota
New Mexico
North Carolina
Ohio
Texas
Vermont
Wyoming
District of Columbia

Bay Area APCD^{*} (ppm)
Philadelphia
South Coast AQMD (ppm)

NITRIC ACID PLANTS²

Alabama
Arizona
Connecticut
Florida
Georgia
Illinois
Kentucky
Louisiana
Maryland
Massachusetts^{*} (ppm)
Minnesota
Nevada (lb/ton and ppm)
North Carolina
Ohio
Tennessee
Texas (ppm)
Virginia
Wyoming

Jefferson County^{*} (ppm)
Philadelphia

* Emission standard not directly source-related, but in the form used for "All Existing Sources"

¹Units of standard are lb NO_x (as NO₂)/10⁶ Btu, unless noted otherwise.

²Units of standard are lb NO_x (as NO₂)/ton of 100% acid, unless noted otherwise.

TABLE II-14

UNITS OF AGENCY-APPROVED NO_x EMISSION STANDARDS

STATE	FFSG	NITRIC ACID PLANTS
ALABAMA	-	1b/ton acid
ALASKA	-	-
ARIZONA	-	1b/ton acid (2 hr. avg.)
ARKANSAS	-	-
CALIFORNIA	1b/hr	-
COLORADO	-	-
CONNECTICUT	$\frac{1b \text{ (as NO}_2\text{)}}{10^6 \text{ Btu}}$	1b/ton acid
DELAWARE	$\frac{1b \text{ (as NO}_2\text{)}}{10^6 \text{ Btu}}$	-
FLORIDA	-	1b/ton acid
GEORGIA	$\frac{1b \text{ (as NO}_2\text{)}}{10^6 \text{ Btu}}$	1b/ton acid
HAWAII	-	-
IDAHO	-	-
ILLINOIS	1b/10 ⁶ Btu	1b/ton acid
INDIANA	1b/10 ⁶ Btu	-
IOWA	-	-
KANSAS	-	-
KENTUCKY	-	1b/ton acid
LOUISIANA	-	1b/ton acid
MAINE	-	-
MARYLAND	1b/10 ⁶ Btu	$\frac{1b \text{ (NO}_x\text{)}}{\text{ton acid}}$
MASSACHUSETTS	1b/10 ⁶ Btu	ppm*
MICHIGAN	-	-
MINNESOTA	1b/10 ⁶ Btu	1b/ton acid
MISSISSIPPI	-	-
MISSOURI	-	-
MONTANA	-	-
NEBRASKA	-	1b/ton and ppm
NEVADA	-	-
NEW HAMPSHIRE	-	-
NEW JERSEY	-	-
NEW MEXICO	1b/10 ⁶ Btu	-
NEW YORK	-	-

TABLE II-14 (CONTINUED)

UNITS OF AGENCY-APPROVED NO_x EMISSION STANDARDS

STATE	FFSG	NITRIC ACID PLANTS
NORTH CAROLINA	1b/10 ⁶ Btu	1b/ton acid
NORTH DAKOTA	-	-
OHIO	1b/10 ⁶ Btu	1b/ton acid
OKLAHOMA	1b/10 ⁶ Btu (new)	1b/ton acid (new)
OREGON	-	-
PENNSYLVANIA	-	-
RHODE ISLAND	-	-
SOUTH CAROLINA	-	-
SOUTH DAKOTA	-	-
TENNESSEE	-	1b/ton acid or ppm
TEXAS	1b/10 ⁶ Btu (2 hr. avg.)	ppm
UTAH	-	-
VERMONT	$\frac{1b \text{ (as NO}_x\text{)}}{10^6 \text{ Btu}}$	-
VIRGINIA	-	$\frac{1b \text{ (as NO}_2\text{)}}{\text{ton acid}}$
WASHINGTON	-	-
WEST VIRGINIA	-	-
WISCONSIN	-	-
WYOMING	1b/10 ⁶ Btu	1b/ton acid (2 hr. avg.)
DIST. OF COL.	1b/10 ⁶ Btu	-
PUERTO RICO	-	-
VIRGIN ISLANDS	-	-
ALLEGHENY CO.	-	-
BAY AREA APCD	ppm *	-
BOSTON	-	-
CHICAGO	-	-
DADE CO.	-	-
DENVER	-	-
JEFFERSON CO.	-	ppm *
PHILADELPHIA	1b/10 ⁶ Btu (2 hr. avg.)	1b/ton acid (2 hr. avg.)
PUGET SOUND	-	-
ST. LOUIS	-	-
SOUTH COAST AQMD	ppm (15 min. avg.)	-
WAYNE CO.	-	-

* Emission standard is for non-specific source category, e.g.,
"All Existing Sources"

process operation or the associated air pollution control equipment and subsequently result in excessive emissions. Similarly, excess emissions are commonplace when air pollution control equipment is shutdown for routinely scheduled maintenance while the related source continues to operate.

Most of the provisions for malfunctions and scheduled maintenance are contained within the General Provisions section of an agency's regulations, or else they are contained within the overall text of a separate regulation or sub-chapter. There are a few agencies, however, that have structured their regulations in such a manner as to include malfunction/maintenance clauses as part of a regulation specific to a particular source category (e.g., New Hampshire, Massachusetts, New York and West Virginia). Likewise, although the preponderance of malfunction/maintenance provisions are non-specific to any one given pollutant, there are a few agencies (Georgia, Indiana and Missouri) with malfunction and/or maintenance clauses in a regulation dealing only with one particular pollutant.

A survey of the regulations of the fifty states, two territories and the District of Columbia revealed that all but eight¹ of those 53 agencies have some type of provision dealing with excess emissions during equipment malfunctions and/or control equipment maintenance. Of the twelve local agency regulations reviewed, three (Boston, Dade County and Wayne County) lacked any provisions addressing excess emissions during malfunction and maintenance. A majority of the regulations containing specific provisions of this nature address not only the occurrences of malfunctions in process and control equipment but also the expectation of control equipment shutdown for scheduled maintenance. Nineteen (19) of the 54 agencies with some type of exception provision addressed malfunctions, upsets or breakdowns

¹ Alaska, California, Delaware, New Jersey, North Carolina, Pennsylvania, South Carolina, Vermont; includes California where the regulations are administered upon a local or regional basis.

but have no companion regulation for maintenance of control equipment. Connecticut, Massachusetts, and Rhode Island have malfunction/maintenance exceptions applicable to air pollution control equipment but no similar regulations for process or source operations. Finally, many of the state and local regulations are worded so generally that a distinction between applicability to process equipment or control equipment cannot be made. This situation arises whenever the subjects of the exception provision are such terms as "installations", "facilities", "source", etc.

Table II-15 is an alphabetical tabulation, by state and by local agency, of the salient features of each agency's provisions for malfunctions and maintenance. Of the 54 agencies having some form of malfunction or maintenance stipulation, only three (Georgia, Massachusetts and Missouri) have no requirement for agency notification of such occurrences. In the case of malfunctions, agency notification requirements range from "within 24 hours" from the beginning of the malfunction (e.g., Alabama and Idaho) to as long as within 10 days after the malfunction began (Kansas). Certain states qualify their reporting requirements for malfunctions by excluding minor breakdowns and brief upsets and require notification only of occurrences with more significance such as when a malfunction lasts "longer than 1 hour" (Indiana and Minnesota), or "longer than 4 hours" (Maryland and Montana), or "longer than 24 hours" (Tennessee). Virginia requires notification of a malfunction if the period of excessive emissions lasts longer than 1 hour. Connecticut's provision for shutdown of air pollution control equipment requires agency notification if the equipment is inoperative for more than 72 hours. The reporting requirement for advance notification of the intent to shutdown control equipment for scheduled maintenance contains the most universal element of the malfunction/maintenance provisions. Almost all agencies requiring such notification stipulate the following five items of information to be reported.

1. Specific identification of the facility in question.
2. Estimated length of time for equipment to be out of service.

TABLE II-15

PROVISIONS FOR MALFUNCTIONS AND SCHEDULED MAINTENANCE
SOURCE OPERATION AND AIR POLLUTION CONTROL (APC) EQUIPMENT

AGENCY	ADDRESSED TO			INCLUDES			DETAILS OF PROVISION							COMMENTS
	SOURCE OPERATION	APC EQUIPMENT	MALFUNCTION, BREAKDOWN, UPSET	SCHEDULED MAINTENANCE	AGENCY NOTIFICATION REQUIRED	MUST SOURCE SHUT DOWN?	ALLOWABLE PERIOD OF EXCESS EMISS.	WRITTEN PLAN REQ'D?	ADDITIONAL TIME EXTENSION OF MALFUNCTION PERIOD	SPECIFIC TO POLLUTANT?				
ALABAMA	Yes	Yes	Yes	Yes	Yes Within 24 hours	No	NS	For sched'd maint.	NS Notify when corrected	No	-	-		
ALASKA	No	No	-	-	-	-	-	-	-	-	-	-		
ARIZONA	Yes	Yes	Yes	Yes	Yes	No	NS ² Reasonable & necessary	Yes	NS Notify when corrected	No	-	No provisions Upset must be unavoidable & not result of negligence		
ARKANSAS	Yes	Yes	Yes	Yes	Yes Within 24 hours	No	NS	For sched'd maint.	NA	No	-	Program of procedures to minimize malfunctions, etc. MUST be filed.		
CALIFORNIA	- ¹	- ¹	- ¹	- ¹	- ¹	- ¹	- ¹	- ¹	- ¹	- ¹	- ¹	- ¹		
COLORADO	Yes [*]	Yes [*]	Yes	No	Yes Within 1 day	No	NS	Report of remedy	NA	No	-	Definition of upset states "is not due to improper or careless operation."		
CONNECTICUT	No	Yes	Yes	Yes	If APC equip. is inoperative > 72 hours	No	NS	No	NA	No	-	May specify conditions to operation of source while APC equip. is inoperative.		
DELAWARE	No	No	-	-	-	-	-	-	-	-	-	No provisions		
DIST. OF COLUMBIA	Yes [*]	Yes	Yes ⁴	Yes	Yes	No ⁴	NS	For sched'd maint.	NA	No	-	-		
FLORIDA	Yes [*]	Yes [*]	Yes	No	Yes	No	2 hr/day	Quarterly report may be reas'd	NS At discretion of agency	No	-	Malfunctions resulting from poor operation or poor maint. are prohibited.		
GEORGIA	Yes [*]	Yes [*]	Yes	No	No	No	NS	No	NA	Smoke	-	-		
HAWAII	Yes	Yes	Yes	Yes	Yes	No	NS	For sched'd maint.	NS Notify when corrected	No ³	-	-		
IDAHO	Yes	Yes	Yes	Yes	Yes Within 1 day	For APC maint. wherever possible ⁵	NS	Yes	NA Report of remedy may be required	No	-	Max. effort must be made to do APC equip. maint. when source not operating.		
ILLINOIS	Yes	Yes	Yes	No	Yes	Yes ⁶	In permit	Yes In permit	NS	No	-	Written report may be required.		

TABLE 11-15 (Cont Inued)
PROVISIONS FOR MALFUNCTIONS AND SCHEDULED MAINTENANCE
SOURCE OPERATION AND AIR POLLUTION CONTROL (APC) EQUIPMENT

AGENCY	ADDRESSED TO		INCLUDES		DETAILS OF PROVISION						COMMENTS
	SOURCE OPERATION	APC EQUIPMENT	MALFUNCTION, BREAKDOWN, UPSET	SCHEDULED MAINTENANCE	AGENCY NOTIFICATION REQUIRED	MUST SOURCE SHUT DOWN?	ALLOWABLE PERIOD OF EXCESS EMISS.	WRITTEN PLAN REQ'D?	ADDITIONAL TIME EXTENSION OF MALFUNCTION PERIOD	SPECIFIC TO POLLUTANT?	
INDIANA	Yes	Yes	Yes	Implied	If malfunction > 1 hour	Yes ⁷	NS	Mal-func. emiss. reduc. program	NS	Visible Emission	Malfunction plan required if emissions > 2000 lb/hr.
IOWA	Yes	Yes	Yes	No ⁸	Yes Within 1 day	No	NS	Report of remedy	NA	No	Addresses only emergency maintenance.
KANSAS	Yes	Yes	Yes	Yes	Yes Within 10 days	No	NS	For scheduled maint.	NA	No	Frequency of breakdowns must not be excessive.
KENTUCKY	Yes ⁹	Yes	Yes	Yes	Yes	No	NS	If requested	NA	See footnotes ⁹	Director must decide whether excess emiss. are due to malfunction. are deemed violation.
LOUISIANA	Yes [*]	Yes [*]	Yes	No	Yes	No	NS	Report of remedy	NA	No ¹⁰	Notification is not an automatic exemption
MAINE	Yes [*]	Yes [*]	Yes	No	Yes Within 48 hours	No	NS	Report	NA	No	-
MARYLAND	Yes [*]	Yes [*]	Yes	No	If malfunction > 4 hr	No	Max. 10 days (with plan)	Yes	Not > 10 days	No	-
MASSACHUSETTS	No	Yes	Yes	Yes	No	No	NS	No	NA	Yes	Provides for "reasonable" maint. period or unexpected & unavoidable failure of equipment.
MICHIGAN	Yes	Yes	Yes	No	Yes	No	NS	Yes	NS	No	Facility with "unreasonable breakdown frequency" not permitted to operate.
MINNESOTA	Yes	Yes	Yes	Yes (Startup/shutdown)	If malfunction > 1 hr	No	NS	Details of cause & duration	NS	No	Ex. Dir. may specify time, amt., & duration for sched. maintenance.
MISSISSIPPI	Yes [*]	Yes [*]	Yes	Yes	Yes	No	NS	No	NA	No	-
MISSOURI	Yes [*]	Yes [*]	Yes	No ¹¹	No	No	NS	No	NA	Particulate	-

TABLE II-15 (Cont Inued)
PROVISIONS FOR MALFUNCTIONS AND SCHEDULED MAINTENANCE
SOURCE OPERATION AND AIR POLLUTION CONTROL (APC) EQUIPMENT

AGENCY	ADDRESSED TO		INCLUDES			DETAILS OF PROVISION										COMMENTS
	SOURCE OPERATION	APC EQUIPMENT	MALFUNCTION, BREAKDOWN, UPSET	SCHEDULED MAINTENANCE	AGENCY NOTIFICATION REQUIRED	RUST SOURCE SHUT DOWN?	ALLOWABLE PERIOD OF EXCESS EMISS.	WRITTEN PLAN REQ'D?	ADDITIONAL TIME EXTENSION OF MALFUNCTION PERIOD	SPECIFIC TO POLLUTANT?						
MONTANA	Yes ^a	Yes ^a	Yes	No	Yes If mal-function > 4 hrs	No	Max. of 10 days	Yes	At discretion of agency.	No	Report of remedy may be required.					
NEBRASKA	Yes	Yes	Yes	Yes	Yes	No	NS	For sched. maint.	NA	No	Frequency of breakdowns must not be excessive.					
NEVADA	Yes ^a	Yes ^a	Yes	Yes	Yes Within 24 hrs.	No	NS	For sched. maint.	NA	No	Upset must be unavoidable and not result of carelessness or marginal operation.					
NEW HAMPSHIRE	Yes	Yes	Yes	No	Yes Within 8 hrs.	No	Max. 48 hrs. ¹²	No	Yes >48 hours, by request	No	Malfunction provisions included within specific source standards sections.					
NEW JERSEY	No	No	-	-	-	-	-	-	-	-	No provisions					
NEW MEXICO	Yes	Yes	Yes	Yes	Yes Within 24 hrs.	No	NS	For sched. maint.	NA	No	Frequency of breakdowns must not indicate carelessness or marginal operation.					
NEW YORK	Yes ¹³	No	Yes ¹³	No	Yes	No	NS	No	NA	Yes ¹³	See footnote ¹³					
NORTH CAROLINA	No	No	-	-	-	-	-	-	-	-	No provisions					
NORTH DAKOTA	Yes ^a	Yes	Yes	Yes	Yes	No	Max. of 10 days	Yes	Major equipment failure	No	No provisions					
OHIO	Yes	Yes	Yes	Yes	Yes	No	NS	For sched. maint.	NS Notify when corrected.	No	Board will take "appropriate action" if determines that shutdown was avoidable, induced, or prolonged.					
OKLAHOMA	Yes	Yes	Yes	Yes	Yes	No	NS	For sched. maint.	NS Notify when corrected.	No	No provisions					
OREGON	Yes	Yes	Yes	Yes	Yes	Yes ^{14, 15}	Max. 48 hrs	For sched. maint. ¹⁶	At discretion of director.	No	Notify when corrected. Report of remedy may be requested.					
PENNSYLVANIA	No	No	-	-	-	-	-	-	-	-	No provisions					

TABLE 11-15 (Continued)
PROVISIONS FOR MALFUNCTIONS AND SCHEDULED MAINTENANCE
SOURCE OPERATION AND AIR POLLUTION CONTROL (APC) EQUIPMENT

AGENCY	ADDRESSED TO			INCLUDES			DETAILS OF PROVISION							COMMENTS
	SOURCE OPERATION	APC EQUIPMENT	MALFUNCTION, BREAKDOWN, UPSET	SCHEDULED MAINTENANCE	AGENCY NOTIFICATION REQUIRED	MUST SOURCE SHUT DOWN?	ALLOWABLE PERIOD OF EXCESS EMISS.	WRITTEN PLAN REQUIRED?	ADDITIONAL TIME EXTENSION OF MALFUNCTION PERIOD	SPECIFIC TO POLLUTANT?				
PUERTO RICO	Yes	Yes	Yes	Yes	Yes	No	NS	For sched. maint.	NS Notify when corrected.	No	-			
RHODE ISLAND	No	Yes	Yes	No	Yes	No	Max. 24 hours	Petition for variance	> 24 hours, NS	No	-			
SOUTH CAROLINA	No	No	-	-	-	-	-	-	-	-	No provisions			
SOUTH DAKOTA	Yes	Yes	Yes	Yes	Yes	No	NS	No	NS Notify when corrected.	No	-			
TENNESSEE	Yes	Yes	Yes	Yes	If Mal-function > 24 hrs.	No	NS	For sched. maint.	NS Notify when corrected.	No	Due allowance, subj. to Administrative hearing, to be made for excess violations.			
TEXAS	Yes*	Yes*	Yes	Yes	Yes	No	NS	For sched. maint.	NA	No	-			
UTAH	Yes*	Yes	Yes	Yes	Yes	No	NS	For correction of mal-function	NA	No	See Footnote 17			
VERMONT	No	No	-	-	-	-	-	-	-	-	No provisions			
VIRGINIA	Yes	Yes	Yes	Yes	If period of excess emiss. > 1 hr	No	No ¹⁹	For correction of mal-function until corrected.	If malfunction > 30 days, must report semi-monthly	No	Have special regulation requiring immediate shutdown of sources subject to hazardous pollutant emission standards.			
VIRGIN ISLANDS	Yes	Yes	Yes	Yes	Yes	No	NS	Yes	NA	No	Upsets must not be so frequent as to indicate careless, marginal or unsafe operation.			
WASHINGTON	Yes*	Yes*	Yes	Yes	No	No	NS	Report of remedy may be requested.	NA	No ²⁰	-			
WEST VIRGINIA	Yes*	Yes*	Yes	No	Yes	No	2 days ²¹	Yes	Max. 10 days total ²¹	No specific to source categories.	-			

TABLE II-15 (Cont Inued)
PROVISIONS FOR MALFUNCTIONS AND SCHEDULED MAINTENANCE
SOURCE OPERATION AND AIR POLLUTION CONTROL (APC) EQUIPMENT

AGENCY	ADDRESSED TO		INCLUDES		DETAILS OF PROVISION					SPECIFIC TO FOLLOW-UP?	COMMENTS
	SOURCE OPERATING?	APC EQUIPMENT?	MALFUNCTION, BREAKDOWN, UPSET	SCHEDULED MAINTENANCE	AGENCY NOTIFICATION REQUIRED	MUST SOURCE SHUT DOWN?	ALLOWABLE PERIOD OF EXCESS EMISS.	WRITTEN PLAN REQUIRED?	ADDITIONAL TIME EXTENSION OF MALFUNCTION PERIOD		
WISCONSIN	Yes	Yes	Yes	Yes	Yes	No	NS	For scheduled maint.	NA	No	-
WYOMING	Yes	Yes	Yes	No	Yes Within 24 hours	No	NS	Yes	NA	No	-
ALABAMA	Yes	Yes	Yes	Yes	Yes	No	NS	Report of remedy ²²	NS Notify when corrected.	No	Report of breakdown does not prevent prosecution for a violation.
BAY AREA	Yes	Yes	Yes	Yes	Yes	No	Max. 48 hours.	Report of remedy	No	No	Frequency of malfunction & maint. must not be more than is reasonable
BOSTON	No	No	-	-	-	-	-	-	-	-	No provision.
CHICAGO	Yes	Yes	Yes	Yes	Yes	No	NS	No	NS Notify when corrected.	-	-
DADE CO.	No	No	-	-	-	-	-	-	-	-	No provision.
DENVER	Yes	Yes	Yes	Yes	Yes	No	10 days	No	No	No	Upset must have been anticipated and unpreventable.
JEFFERSON CO.	Yes	Yes	Yes	Yes	Yes	No	10 days	Yes	Variance req'd (must still notify when corrected.)	No	Agency must determine breakdown was unavoidable & all reas. steps were made to minimize time & emissions. ²³
PHILADELPHIA	Yes	Yes	Yes	Implied	Yes	No	NS	No	NA	No	-
PUGET SOUND	Yes	Yes	Yes	No	Yes	No	NS	Yes If requested	NA	No	-
ST. LOUIS	Yes	Yes	Yes	Yes	Yes	No	NS	Yes If requested	NA	No	Maximum effort to conduct maint. during non-operatin per'dn of stce.
SOUTH COAST MPD	Yes	Yes	Yes ²⁴	No	Yes	Yes ²⁵	Max. 24 hours.	Report of remedy	Must petition for emergency variance.	No	Excess emiss. are not exempt from Rule 402 (nuisance).
WAYNE CO.	No	No	-	-	-	-	-	-	-	-	No provisions.

TABLE 11-15 (Continued)
PROVISIONS FOR MALFUNCTIONS AND SCHEDULED MAINTENANCE
SOURCE OPERATION AND AIR POLLUTION CONTROL (APC) EQUIPMENT

FOOTNOTES

- NS - Not Specified NA - Not Applicable
- * General provision which implies both types of equipment.
- 1 Administered by "local" agencies.
- 2 Where start-up or shutdown in normal operating condition, a continuing specified period of time may be granted.
- 3 Separate provision allowing excess visible emissions whenever breakdown occurs.
- 4 Only mention of malfunctions is a provision that gives Commissioner authority to order source to shutdown until APC maintenance is completed or malfunctioning equipment is repaired.
- 5 During maintenance shutdown of APC equipment, must provide auxiliary control equipment to keep pollutant below harmful level or must reduce production.
- 6 Unless source permit provides for excess emissions during malfunctions.
- 7 If source out of compliance more than 10% of operating time for last 12 months, and if source has no approved malfunction emission reduction plan.
- 8 Specific provision for cleaning APC equipment not required to be shutdown - excess particulate emissions allowed 6 min/hr.
- 9 Specific clause stating that opacity regulations are not applicable during startup, shutdown, or malfunction; specific clause that standards not applicable during emergency caused by unavoidable breakdown (indirect heat exchangers.)
- 10 Specific provision for notification if flare-controlled upset exceeds 6 hours.
- 11 Exceptions to standard allowed during cleaning of APC equipment.
- 12 Twenty-four hours for incinerators; immediate notification required; must be unforeseeable breakdown; further extension of time if source accepts consent order with repair schedule and compliance schedule.
- 13 Specific provisions for specific process upsets.
a Visible emissions from Portland cement. b Smoke emissions from stationary combustion. c Sulfur compounds flared from petroleum refineries.
- 14 If malfunction is not corrected within 48 hours.
- 15 If malfunction occurs during Alert, Warning, or Emergency stage of episode, or if Director deems the excess emissions present imminent and substantial endangerment to health, source must shutdown immediately.
- 16 If APC equipment shutdown for maintenance is more frequent than once/90 days, or if that shutdown >48 hours, a written plan may be required.
- 17 Special provision for nonferrous smelters and excess emissions of SO_x.
- Usual requirements of: (1) Agency notification of malfunction or shutdown for maintenance.
(2) Written report of details for correcting malfunction.
- Additionally:
(1) Any gases bypassing a desulfurization unit during periodic maintenance must still be processed by gas cleaning equipment normally preceding the desulfurization unit.
(2) The monthly emission limitation of either 3750 tons sulfur/month or 14% of sulfur feed (whichever is less) may be exceeded during malfunctions or maintenance shutdowns. However, the running annual average emission (average of 12 consecutive months) may never exceed the monthly emission limitation regardless of the frequency of malfunctions or of planned and unplanned maintenance.
- 18 See details of regulation for semi-monthly reporting requirements; must notify when corrected. If malfunction >6 months, must apply for variance.
- 19 Excess emissions due to malfunction are not considered a violation if source has been in compliance for 90% of the operating time during most recent 12 months.
- 20 Provisions only applicable to regulations for Kraft pulping mills, sulfate pulping mills, and primary aluminum plants.
- 21 Excess emissions allowed from 2-10 days for hot mix asphalt plants and SO₂ from fuel burning and "manufacturing process source operations"; no specific periods of time for either coal preparation/handling or for incinerators.
- 22 Failure to submit notices or reports as required are violations.
- 23 For repetitions malfunctions, written program to permanently correct is required. Agency will determine if corrective actions are required when 12 or more of same type of failure occur within one year.
- 24 Must prove cause was not operator error, neglect, or improper operation/maintenance procedures.
- 25 Must shutdown at end of cycle or within 24 hours, whichever is sooner.

3. Nature and quantity of estimated emissions during the maintenance period.
4. All steps (off-shift labor, reduced production, alternate control device, etc.) taken to minimize the emissions and period of time.
5. Reasons why the process operations should not be shutdown concurrently with the control equipment.

None of the agencies reviewed are so strict towards malfunctions and maintenance that they require immediate shutdown of the source until the malfunction is corrected or the maintenance is completed. However, the various regulations have a wide variation in the tolerance for source operations during these periods. Illinois will allow a source to continue operation with a malfunction when that condition is so stipulated in the source's operating permit. Similarly, if a source has an approved malfunction emission reduction plan, Indiana allows that operation to continue during a malfunction if that source has been in compliance for 90% or more of the operating time during the most recent twelve-month period.¹ Oregon dictates that an operation must be shutdown if the associated malfunction is not corrected within 48 hours. Idaho simply states that sources must shutdown whenever possible for periods of control equipment maintenance. Connecticut reserves the option of specifying source operating conditions during periods of control equipment inoperativeness. Of the local agency regulations reviewed, the Bay Area APCD allows a maximum of 48 hours for a malfunction to be corrected. South Coast AQMD specifies that malfunctions must be followed by shutdown of the operation at the end of a cycle or within 24 hours, whichever is sooner.

As shown in Table II-15 some agencies specify the maximum allowable period of excess emissions due to malfunctions. This time period for malfunction-related excess emissions ranges from 24 hours to 30 days. Florida has a unique malfunction provision which permits related excess

¹ Provision is specific to visible emissions.

emissions for 2 hours/day. Virginia has a malfunction provision covering the first 30 days of such an occurrence after which additional reporting requirements are invoked for further extensions of malfunction periods. Similarly, other agencies, as indicated in Table II-15, have provisions requiring sources to petition for a variance if malfunctions extend beyond the specified permissible time period. Some regulations simply state that source operation may be continued at the discretion of the agency in question. On the other hand, some agencies (e.g., Maryland) have no regulatory mechanism for extending periods of source operation during equipment malfunction past the allotted time frame for correction.

Utah has a unique provision to deal with excess emissions of sulfur oxides from non-ferrous smelters during periods of malfunction or scheduled maintenance. In addition to the routine requirements for agency notification and reporting of corrective actions, Utah requires all other smelter control equipment to be in use when a desulfurization unit is by-passed for periodic maintenance. Furthermore, during malfunctions or maintenance periods the smelter's monthly SO_x emission limitation may be exceeded, but the running annual average SO_x emission may never exceed the monthly emission standard regardless of the frequency of malfunctions or maintenance.

For clarification and additional information beyond the comments and footnotes of Table II-15, the full text of each agency's malfunction and maintenance provision has been included in Appendix D of Volume III.

SECTION III

STATE-ADOPTED CONTINUOUS MONITORING REGULATIONS FOR EXISTING STATIONARY SOURCES

In order to provide some guidance to the individual states for implementing continuous monitoring regulations for existing sources, Appendix P of 40 CFR 51 details specific minimum requirements for continuous monitoring that each SIP must incorporate. Four stationary source categories have been identified as ones with existing facilities, with appropriate exceptions, which must conduct continuous emission monitoring. Those four source categories are the following:

1. Fossil fuel-fired steam generators (FFFSG)
2. Fluid bed catalytic cracking unit (FBCCU) catalyst regenerators
3. Sulfuric acid plants
4. Nitric acid plants

Appendix P of Part 51 has particular criteria for establishing which facilities within each source category must implement continuous monitoring. Specific details of installation, operation and maintenance, data reduction, and emission reporting are delineated within Appendix P. The continuous monitoring systems' performance specifications of Appendix B of 40 CFR 60 are incorporated by reference in Appendix B as well. A comprehensive review and analysis of the Appendix P requirements are not within the scope of work of this project. The particular personnel within EPA to whom this report is directed currently possess a sound knowledge of and familiarity with the Appendix P contents. The complete texts of both Appendix P of Part 51 and Appendix B of Part 60 have been included in Volume III of this document in order to facilitate reference to those basic regulations.

A review of the continuous monitoring provisions of the individual states resulted in the following scheme of classifying the extent to which a state has adopted the minimum monitoring requirements set forth in Part 51.

1. CLASS I - Those states that have incorporated detailed continuous monitoring regulations which are usually structured, both in form and

content, much like the Appendix P and Appendix B details.

- o CLASS IA - Those states that would be considered CLASS I states with the exception that monitoring provisions for one or more of the four source categories identified by Part 51 have not been promulgated.
- 2. CLASS II - Those states that have specific continuous monitoring details in their regulations, but fall short of incorporating the myriad specifications of Appendix P and/or Appendix B.
- 3. CLASS III - Those states that have only the most general of continuous monitoring regulations, usually consisting of nothing more than identification of the source required to monitor and of the specific pollutant to be measured.
- 4. CLASS IV - Those states that have no continuous monitoring provisions required of existing sources except for, in some instances, the nebulous "catch-all" section of enabling legislation that allows that certain sources may be required to conduct continuous monitoring as directed.

The remainder of this section is a state-by-state synopsis of the extent to which each agency has complied with the minimum emission monitoring requirements as directed by Part 51. In order to avoid excessive repetition throughout this analysis, the specific areas that are highlighted are those in which an agency's regulations differ from the Appendix P regulations. Furthermore, it is beyond the scope of this survey to determine the particular reasons why a given state regulation deviates from the Part 51 requirements. Therefore, if a state is identified as a CLASS I or IA state, but only a few items of continuous monitoring are addressed, the reader must recognize that the areas not discussed are essentially identical to the Part 51 Federal regulations.

ALABAMA (CLASS IA)

- o Follows Part 51, Appendix P, and Part 60, Appendix B.
- o No CM regulations for existing nitric acid plants or for existing FBCCU catalyst regenerators.
- o All affected facilities required to submit detailed plan for complying with CM provisions.
- o Director has authority to specify data averaging times and sampling intervals different from those of Appendix B performance specifications.
- o Any monitoring system malfunction lasting more than 48 hours must be reported in writing.

ALASKA (CLASS IV)

- o No provisions for continuous monitoring of existing sources as identified in Appendix P, Part 51.
- o General regulation for continuous emission recording devices as specified by the Department for sulfite pulp mills and kraft pulp mills.

ARIZONA (CLASS IV)

- o No provisions for continuous monitoring of existing sources as identified in Part 51.
- o General CM requirements for monitoring SO₂ emissions from the sulfur removal equipment serving copper smelters:
 - (1) Continuously monitor and record SO₂ emissions with $\pm 20\%$ accuracy and confidence level of 95%.
 - (2) Operate and calibrate monitoring equipment in accordance with manufacturer's specifications; calibration must be done at least once per day.

ARKANSAS (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

CALIFORNIA (CLASS II)

- o Has most of the source categories/pollutants required to be continuously monitored in Appendix P.
 - (1) steam generators - opacity, NO_x , CO_2 or O_2
($>250 \times 10^6$ Btu/hour)
 - (2) nitric acid plants - NO_x
 - (3) sulfuric acid plants - SO_2
- o Does not have the details for FFFSG regarding exceptions on the basis of size, type of fuel, capacity factor, and use of particulate control equipment as does Part 51.
- o Does not have the details for exemptions based upon : (1) purchase date of monitor (grandfather clause) and (2) scheduled date for source retirement.
- o Does not have performance specification details of Appendix B, Part 60.
- o Performance criterion established for monitoring equipment is $\pm 20\%$ with confidence levels of 95%.
- o Does not have Part 51 requirements pertinent to: (1) minimum data requirements and excess emission reports and (2) data reduction procedures.
- o Does require data retention for 2 years.
- o Does prescribe additional CM for: (1) sulfur recovery plants - SO_2 and (2) refinery boilers, new cokers, and existing boilers $>10,000$ bbl/day - CO.
- o No provisions for continuous monitoring of opacity from existing FBCCU catalyst regenerators.

COLORADO (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

CONNECTICUT (CLASS III)

- o Only general opacity monitoring requirements for:
 - (1) Coal-burning equipment
 - (2) Liquid or solid fuel-burning equipment $>5 \times 10^6$ Btu/hour
 - (3) Incinerators $>2,000$ lb (input)/hour
 - (4) Process source with particulate emissions >5 lb/hour
 - (5) Fuel-burning equipment using No. 6 residual oil
- o Exceptions to opacity monitoring requirements:
 - (1) Emergency standby fuel burning equipment operating ≤ 168 hours/year
 - (2) Gas turbines with smoke control apparatus capable of keeping visibles $\leq 20\%$ opacity
- o Commissioner publishes performance standards "from time-to-time" for determining acceptable opacity monitors.
- o Must retain monitoring data for 3 years.
- o Except for necessary maintenance, the monitor cannot be shut down while source is operating; CM shutdown >72 hours requires agency notification.
- o Grandfather clause exempts any opacity monitors installed before 9/1/74 until 1/1/85.
- o Coal-burning equipment $<250 \times 10^6$ Btu/hour do not have to submit quarterly report.

DELAWARE (CLASS IA)

- o Follows Part 51, Appendix P, and Part 60, Appendix B.
- o No CM regulations for existing nitric acid plants.
- o Opacity monitoring required of waste heat boilers if more than 250×10^6 Btu/hour heat input is provided by auxiliary fuel.
- o Performance certification testing must be repeated after repairs or adjustments to a monitoring system (option of Paragraph 4.4, Appendix P).

- o F and F_c factors for fuel burning equipment are subject to approval of the Secretary, and are not merely those of 40 CFR 60.45(f) as referenced by Appendix P.

DISTRICT OF COLUMBIA (CLASS IV)

- o Nothing more than enabling legislation pertinent to sources emitting >100 tons/year "of any air pollutant"; details are administered by the Commissioner.

FLORIDA (CLASS III)

- o General provision for SO_2 emission monitoring by existing FFFSG in a manner, frequency, and location subject to approval by the Department.

GEORGIA (CLASS III)

- o Sulfuric acid plants must be "equipped with a continuous SO_2 monitor and recorder . . .".
- o Nitric acid plants must be "equipped with a continuous NO_x monitor and recorder . . .".

HAWAII (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

IDAHO (CLASS IV)

- o No provisions for continuous monitoring of existing sources as identified in Appendix P, Part 51.
- o Specific CM requirements for TRS from kraft pulp mills:
 - (1) capable of determining compliance with TRS emission standards
 - (2) cycling time not to exceed 30 minutes
 - (3) minimum affected facilities
 - recovery furnace stacks
 - lime kiln stacks
 - (4) source must submit detailed compliance program

- (5) data to be reported monthly includes:
 - daily average emission of TRS gases for each source monitored (ppm, dry basis)
 - number of hours per day that recovery stack TRS emissions exceed standard
 - daily maximum TRS concentration in recovery furnace stack
 - monthly average emissions of TRS from each source in kraft cycle that is monitored (lb S/equiv. air-dried ton of pulp processed)
 - average daily kraft pulp production
- o Specific CM requirements for SO₂ from combined zinc/lead smelters emitting >50 tons SO₂/year.
 - (1) Maintained, calibrated and operated in accordance with manufacturer's specifications
 - (2) Calibration and/or maintenance records must be kept; instrument readings before and after any calibration and/or maintenance must be clearly shown.
 - (3) Data must be retained for at least 2 years.
 - (4) Calculate one-hour average SO₂ emission rates each day/ submit calculation to the Director monthly.
 - (5) CM system shall be used for determining compliance with SO₂ emission standard.
 - (6) Specifies procedure for calculating SO₂ emission rate.

ILLINOIS (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

INDIANA (CLASS I)

- o Incorporates all provisions of Appendix P, Part 51.
- o Requires specific notification of Board for monitoring system malfunction exceeding one hour.
- o Specifies 6-minute averaging period for opacity and 3-hour periods for gases.

IOWA (CLASS II)

- o Follows details of Part 51, Appendix P, and Part 60, Appendix A, only for the following:
 - (1) opacity from coal-fired or coal-gas-fired steam generating units
 - (2) SO₂ from sulfuric acid plants
- o No CM regulations for existing nitric acid plants or for existing FBCCU catalyst regenerators.
- o Quarterly excess emission reports must be filed on forms provided by the Executive Director.
- o Written notice of a continuous monitor performance test must be given at least 15 days before the evaluation; written report of test results must be submitted.
- o Does not address the following topics covered by Paragraph 3.0 of Appendix P, Part 51:
 - (1) Calibration gases for required SO₂ monitoring systems.
 - (2) Cycling times of required opacity and SO₂ monitoring systems.
 - (3) Monitor locations for representative measurements.
 - (4) Minimum requirements for zero and span checks and adjustments.
 - (5) Instrument span setting.
- o Minimum data requirements, methods of data reduction, and methods of data averaging are not specified.
- o Affected steam generators scheduled for retirement within 5 years are exempted from the continuous monitoring requirement; there is no comparable exemption for sulfuric acid plants scheduled for retirement within 5 years.
- o Existing steam generator with projected annual average capacity factor <30% is exempt from CM.

KANSAS (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

KENTUCKY (CLASS II)

- o Follows most of the Part 51 areas of applicability, but not nearly as detailed as Appendix B.
- o No CM regulations for FBCCU catalyst regenerators.
- o No performance specifications of Appendix P.
- o Terminology used is "indirect heat exchangers" in lieu of FFFSG.
- o Has provision for fuel sulfur monitoring in place of SO₂ emission monitoring.
- o Generalized performance criteria for any monitoring system.
 - (1) $\pm$ 20% with 95% confidence level (sic).
 - (2) Calibrated as prescribed by manufacturer.
 - (3) "Zero adjustment and calibration procedures" as prescribed by the manufacturer at least once daily, or more frequently if specified by manufacturer.
- o Data reduction and retention.
 - (1) Indirect heat exchangers and sulfuric acid plants must reduce "appropriate" measurements to units of the applicable standard daily and must summarize monthly; data and summaries must be retained for 2 years.
 - (2) Nitric acid plants have no provisions for data reduction or retention.
- o No provisions for reporting of excess emissions.
- o No requirement for CO₂ or O₂ monitoring at indirect heat exchanger monitoring SO₂.
- o No provisions for conversion of SO₂ emission measurements to units of applicable standard (lb/10⁶ Btu).
- o In lieu of continuous monitoring affected indirect heat exchangers may apply to conduct periodic source sampling (minimum of once per calendar quarter).

LOUISIANA (CLASS I)

- o Incorporates by reference all minimum emission monitoring requirements of Appendix P, Part 51.

MAINE (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

MARYLAND (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

MASSACHUSETTS (CLASS III)

- o General opacity monitoring requirement for selected fossil fuel utilization facilities.
 - (1) burning oil or solid fuel
 - (2) $> 10 \times 10^6$ Btu/hour
- o "Smoke density sensing instrument and recorder" subject to approval by Department.
- o Data must be retained for one (1) year.
- o Must equip opacity monitor with audible alarm signal set at #1 Ringelmann.

MICHIGAN (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

MINNESOTA (CLASS IA)

- o Follows Part 51, Appendix P, and Part 60, Appendix B.
- o No CM regulations for existing FFFSG.
- o Goes beyond the basic requirements for existing sources set forth in Part 51 by providing for several specific details of continuous monitoring found in Part 60 for NSPS.

MISSISSIPPI (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

MISSOURI (CLASS IA - ST. LOUIS METROPOLITAN AND OUTSTATE MISSOURI AREAS ONLY)

- o Follows details of Appendix P, Part 51, and Appendix B, Part 60, only for opacity from:
 - (1) coal-fired steam generating units
 - (2) FBCCU catalyst regenerators

- o Requires opacity monitoring of portland cement calcining kiln operations in accordance with same procedures above.
- o No CM regulations for SO₂ (and CO₂ or O₂) from coal-fired steam generating units.
- o No CM regulations for sulfuric acid plants or for nitric acid plants.
- o Specifies 6-minute averaging period for opacity (as done in Part 60).
- o Quarterly excess emission reports are due within 30 days from the end of a calendar quarter.
- o Coal-fired steam generating units and portland cement calcining kilns scheduled for retirement within 5 years are exempted from continuous monitoring requirement; there is no comparable exemption for FBCCU catalyst regenerators scheduled for retirement within 5 years.
- o In addition to the normal exceptions to CM requirements in Part 51 for steam generators (i.e., minimum size, capacity factor, etc.), coal-fired boilers using flue gas desulfurization are exempted from the opacity monitoring requirement.
- o Portland cement kilns having baghouses that discharge from multiple stacks or vents are exempt from the opacity monitoring requirement.
- o Affected facilities must submit a compliance program for implementing CM.
- o Affected facilities are only given 12 months to comply.

MONTANA (CLASS IV)

- o No provisions for continuous monitoring of existing sources as identified in Part 51.
- o Specific CM requirements for TRS from kraft pulp mills.
 - (1) Capable of determining compliance with TRS emission standards.
 - (2) Cycling time not to exceed 30 minutes.
 - (3) Minimum affected facilities:
 - recovery furnace stacks
 - lime kiln stacks

- (4) Source must submit detailed compliance program.
- (5) Data to be reported monthly includes:
 - daily average emission of TRS gases for each source monitored (lb. S/10³ lb. of black liquor fired)
 - number of hours per day that recovery furnace emissions > 17.5 ppm (dry)
 - daily maximum TRS concentration in recovery furnace stack
 - monthly average of emissions of TRS gases
 - (a) lb. S/1000 lb. black liquor fired - kraft recovery furnace.
 - (b) lb. S/hour - other sources
 - average daily kraft pulp production
 - average daily black liquor burning rate

NEBRASKA (CLASS IA)

- o Follows the content of Part 51, Appendix P, for FFFSG.
- o No CM provisions for sulfuric acid plants, nitric acid plants, or FBCCU catalyst regenerators.

NEVADA (CLASS I)

- o Incorporates by reference all of the minimum emission monitoring requirements of Appendix P, Part 51, as well as adopting the performance specifications of Appendix B, Part 60.

NEW HAMPSHIRE (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

NEW JERSEY (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

NEW MEXICO (CLASS II)

- o Only provides for SO₂ monitoring from existing coal-burning equipment.
- o No references to either Part 51, Appendix P, or Part 60, Appendix B.
- o Calibrate according to manufacturer's instructions at least once daily, or more frequently if recommended by manufacturer.
 - Reference method must be consistent with specified manual sampling method for SO₂.

- o Quarterly reports, due within 35 days after end of calendar quarter, must contain:
 - (1) hourly averages of SO_2 concentrations in ppm
 - (2) hourly averages of % excess O_2
 - (3) rate of heat input (determined at least once per day)
 - (4) % sulfur and higher heating value of coal being utilized (determined at least once per day)

NEW YORK (CLASS II)

- o Stationary combustion installations $> 250 \times 10^6$ Btu/hour (except gas-fired units) must monitor opacity.
 - (1) No performance specifications; instrument must be approved by Commission and installed/operated per manufacturer's instructions.
 - (2) Must also monitor NO_x if permit filed after 8/11/72; no mention of concurrent CO_2 or O_2 monitoring.
 - (3) Must determine average rate of each fuel burned daily.
 - (4) Must determine gross heating value and ash content (ASTM or equivalent) at least once per week.
 - (5) Data and records must be retained for 3 years.
 - (6) No provisions for data reduction.
 - (7) No provisions for excess emissions reporting.
- o Portland cement kilns and clinker coolers must monitor opacity after 1980.
- o No provisions for continuous monitoring of existing sulfuric or nitric acid plants or of existing FBCCU catalyst regenerators.

NORTH CAROLINA (CLASS I)

- o Adopts all sections of Appendix P, Part 51, and Appendix B, Part 60.
- o Specifies six-minute averaging period for opacity monitoring data instead of the one-minute guideline of Appendix P.
- o Opacity monitoring required of steam generators burning wood or wood with fossil fuels if heat input $> 250 \times 10^6$ Btu/hour and if annual average capacity factor $> 30\%$.

- (1) These opacity regulations are not as detailed as Appendix P.
- (2) These opacity regulations do not reference Appendix B, Performance Specification 1, but instead require:
 - "manufacturer's recommended zero adjustment and calibration procedures"
 - excess emissions must be summarized and reported quarterly
 - data must be retained for one (1) year
- o Coal-burning or residual oil-burning installations exceeding the Part 51 minimum size and capacity specifications, but exempt from SO₂ monitoring by some qualifying exception of Part 51, must nevertheless monitor SO₂ or fuel sulfur. For those sources electing to monitor SO₂ emissions, quarterly reports of the following are required:
 - (1) emission rate, in units of standard
 - (2) maximum instantaneous rate
 - (3) total SO₂ emissions which are excess emissions

There is no provision requiring those sources to concurrently monitor CO₂ or O₂. Monitoring data must be retained for one (1) year.
- o Facilities within the previous two source categories are exempt from CM if source operates <30 days/year.
- o All affected facilities must submit a compliance plan for implementing a CM program.
- o Permit conditions for any source must include any applicable monitoring provisions.
- o Five-year grandfather clause for monitors purchased before 9/1/74 applies only if that monitor had been approved previously under Regulation #8 in effect prior to this regulation.

NORTH DAKOTA (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

OHIO (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

OKLAHOMA (CLASS IA)

- o Follows Part 51, Appendix P, and Part 60, Appendix B.
- o No CM regulations for existing nitric acid plants (however, there are specific data reduction procedures to be employed at nitric acid plants not covered by NSPS).
- o Sulfuric acid plants being utilized as a means of preventing emissions of SO₂ or other sulfur compounds are exempt from continuous monitoring of SO₂.

OREGON (CLASS IV)

- o No provisions for continuous monitoring of existing sources as identified in Appendix P, Part 51.
- o General requirement for continual monitoring of opacity from recovery furnace.
- o Specific provisions for TRS monitoring and subsequent data reporting for:
 - (1) kraft pulp mills
 - (2) sulfite pulp mills

PENNSYLVANIA (CLASS IV)

- o Little more than enabling legislation for continuous monitoring in which the "device" used for continuous measurement of air contaminants must be approved by the Department.

PUERTO RICO (CLASS IV)

- o No provisions for continuous monitoring at existing sources.

RHODE ISLAND (CLASS III)

- o General regulation only for opacity monitoring by:
 - (1) steam or hot water generators burning No. 6 residual oil or solid fuel
 - (2) steam or hot water generators burning all other liquid fuels > 5 x 10⁶ Btu/hour input
- o Requires alarm "calibrated to sound" at 20% opacity.

SOUTH CAROLINA (CLASS IA)

- o Adopts all of the Appendix P, Part 51, and Appendix B, Part 60, requirements for opacity monitoring of FFFSG; even specifies instrument span of approximately 80% opacity.
- o No gaseous emission monitoring requirements for FFFSG.
- o No monitoring requirements for sulfuric or nitric acid plants, FBCCU catalyst regenerators, or any other source categories.

SOUTH DAKOTA (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

TENNESSEE (CLASS IA)

- o Follows details of Appendix P, Part 51 for:
 - (1) FFFSG
 - (2) sulfuric acid plants
 - (3) FBCCU catalyst regenerators
- o No CM provisions for NO_x from existing nitric acid plants.
- o Each emission point of >100,000 acfm must install opacity monitor in accordance with Federal Register; required data retention for minimum of 1 year.

TEXAS (CLASS III)

- o General opacity monitoring requirement for any stationary flue with more than 100,000 acfm and greater than 15% opacity averaged over a 5-minute period. Records must be retained.
- o General SO₂ monitoring requirement for primary nonferrous smelters (Cu, Pb, Zn) and any sulfuric acid plant used for SO₂ control on such smelters. Specifies a cycling time of at least one measurement every 15-minute period.

UTAH (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

VERMONT (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

VIRGINIA (CLASS IA)

- o Follows Part 51, Appendix P, and Part 60, Appendix B.
- o Goes beyond the basic requirements for existing sources set forth in Part 51 by providing for several specific details of continuous monitoring found in Part 60 for NSPS. Examples of these adoptions of NSPS-related regulations to specific existing facilities include:
 - (1) Opacity monitors for fossil fuel-fired steam generators must be spanned at 80, 90 or 100 percent opacity [ref: 40 CFR 60.45(c)(3)].
 - (2) SO₂ monitors for sulfuric acid plants must be spanned at 1,000 ppm; NO_x monitors for nitric acid plants must be spanned at 500 ppm; and opacity monitors for catalyst regenerators must be spanned at 60, 70, or 80 percent opacity. [ref: 40 CFR 60, sections 60.84(a), 60.73(a), and 60.105(a)(1), respectively].
 - (3) Within 30 days of getting the continuous monitoring system installed and operational, the source must conduct continuous monitoring system performance evaluations [based upon schedule established for NSPS in 40 CFR 60.8].
- o No CM provision for SO₂ monitoring of FFFSG.
- o SO₂ emission standard indirectly tied to fuel sulfur limitation.
- o Requires NO_x monitoring at nitric acid plants but does not require NO_x monitoring at FFFSG.
- o Cycling time for opacity monitors with averaging function specified as 6 minutes; no specification for cycling time of opacity monitors not equipped with averaging function.

VIRGIN ISLANDS (CLASS IV)

- o No provisions for continuous monitoring at existing sources.

WASHINGTON (CLASS IA)

- o Incorporates by reference the minimum emission monitoring requirements of Appendix P, Part 51, and the performance specifications of Appendix B, Part 60, for:
 - (1) FFFSG
 - (2) Sulfuric acid plants
 - (3) FBCCU catalyst regenerators
- o No CM provisions for existing nitric acid plants.
- o General continuous opacity monitoring requirement for wood residue fuel-fired steam generators $> 100 \times 10^6$ Btu/hour.
 - (1) no specifics of Appendix P or Appendix B
 - (2) opacity monitoring equipment subject to approval by the Department
- o Specific provisions for TRS monitoring and subsequent data reporting for:
 - (1) kraft pulp mills
 - (2) sulfite pulp mills
- o General continuous opacity monitoring requirement for:
 - (1) kraft pulp mills
 - recovery furnace
 - lime kiln
 - other source
 - (2) sulfite pulp mills
 - recovery system
 - acid plant
 - other source

WEST VIRGINIA (CLASS IV)

- o No provisions for continuous monitoring at existing sources.
- o Has a very general provision that "stack gas monitoring devices" may be required by the Director for SO_2 compliance determination for:

- (1) fuel burning equipment
- (2) sulfuric acid plants
- (3) sulfur recovery plants
- (4) primary non-ferrous smelters
- (5) sulfite pulp mills

WISCONSIN (CLASS IV)

- o No provisions for continuous monitoring at existing sources.

WYOMING (CLASS IV)

- o No provisions for continuous monitoring of existing sources.

EXTENT OF IMPLEMENTATION OF CONTINUOUS MONITORING PROVISIONS BY SELECTED LOCAL AGENCIES

ALLEGHENY COUNTY (CLASS IV)
(Pittsburgh, PA)

- o No provisions for continuous monitoring at existing sources.

BAY AREA APCD (CLASS I)
(San Francisco, CA)

- o Adopts the minimum emission monitoring requirements for all source categories detailed in Appendix P, Part 51.
- o Does not specify any procedures for data reduction.
- o Requires continuous monitoring also of:
 - (1) CO boiler of FBCCU catalyst regenerator - SO_2
 - (2) CO boiler of fluid coker regenerator ($> 10,000$ bbl/day) - opacity, SO_2
 - (3) Sulfur recovery plant (> 100 tpd of SO_2) - SO_2
- o FFFSG with capacity factor $> 30\%$ may request exemption from CM if use factor $> 30\%$ is due to drought conditions (expires 12/31/79).
- o CM recorded violation of emission standard must be reported within 96 hours.
- o All affected facilities must submit in writing a compliance program for implementing CM.

- o General provision requiring all kraft pulp mills to continuously monitor TRS from:
 - kraft recovery furnaces
 - lime kilns

BOSTON, MA (CLASS IV)

- o No provisions for continuous monitoring at existing sources.

CHICAGO, IL (CLASS IV)

- o No provisions for continuous monitoring at existing sources.

DADE COUNTY (CLASS IV)
(Miami, FL)

- o Nothing more than a general provision for continuous automatic monitoring, testing, and records.

DENVER, CO (CLASS IV)

- o No provisions for continuous monitoring at existing sources.

JEFFERSON COUNTY (CLASS II)
(Louisville, KY)

- o Specifies that the following facilities shall conduct continuous monitoring as prescribed by U. S. E. P. A. and by District:
 - (1) indirect heat exchangers $> 250 \times 10^6$ Btu/hour
 - (2) nitric acid plants
 - (3) sulfuric acid plants
 - (4) petroleum refineries
 - and
 - (5) storage vessels of volatile organic materials (cap. $\geq$ 40,000 gal.)
 - (6) sewage treatment plants
- o Does not have any other details as specified in Part 51, nor are Appendix P or Appendix B referenced.

PHILADELPHIA, PA (CLASS IV)

- o No provisions for continuous monitoring at existing sources.

PUGET SOUND APCA (CLASS IV)
(Seattle, WA)

- o No provisions for continuous monitoring at existing sources.

ST. LOUIS, MO (CLASS IV)

- o No provisions for continuous monitoring at existing sources.

SOUTH COAST (CA) AQMD (CLASS I)

- o Follows the basic format of Appendix P, Part 51.
- o No provisions for opacity monitoring from any source.
- o Continuous monitoring of "gaseous sulfur compounds" (calculated as SO₂) required at:
 - (1) sulfuric acid plants
 - (2) sulfur recovery plants equipped with oxidizing tail gas units
 - (3) CO boilers of FBCCU regenerators
 - (4) new and existing fluid cokers > 10,000 bbls/day
- o Procedures for installation, calibration, maintenance and operation are referenced to Part 60 requirements for the particular source, i.e.,
 - (1) FFFSG - 40 CFR 60.45
 - (2) sulfuric acid plants - 40 CFR 60.84
 - (3) nitric acid plants - 40 CFR 60.73
 - (4) petroleum refineries - 40 CFR 60.105
- o Performance Specifications #2 and #3 of Appendix B, Part 60, are incorporated.
- o Summaries of emission monitoring data must be submitted monthly.
- o Excess emissions must be reported within 96 hours.
- o Monitoring equipment shutdown or breakdown of more than 60 minutes must be reported within 48 hours; requirement to conduct monitoring is waived up to 96 consecutive hours; extension of waiver available only by emergency variance.

- o Specific clause giving a representative of AQMD the authority to inspect the continuous monitoring system.
- o General provision for possibility of continuous monitoring for:
 - (1) any source emitting > 992 tons CO/year
 - (2) any source emitting > 99 tons/year of any air contaminant except CO.

WAYNE COUNTY (CLASS IV)
(Detroit, MI)

- o Little more than enabling legislation allowing that the following may be required to use "emission recording monitoring devices":
 - (1) fuel-burning equipment
 - (2) refuse-burning equipment
 - (3) process equipment

ADDENDUM TO VOLUME I

IDENTIFICATION OF EXISTING SOURCE CATEGORIES

SUBJECT TO STATE-ADOPTED REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: ALABAMA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources	●				
Coke Ovens	●				
FFSG >250 MMBtu (Existing)	◆	◆			◆
Sulfuric Acid Plants (Existing)		●	●		
Sulfuric Acid Plants (Existing >300 TPD)		◆			
Sulfuric Acid Plants (New)		●	●		
Petroleum Refinery		●	●		
Process Gas Stream		●	●		
Kraft Pulp Mills			●		
FFSG >250 MMBtu (New)				●	
Nitric Acid Plants				●	
Fuel Burning Equipment		●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: ALASKA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Incinerators	●				
Industrial Processes	●	●			
Fuel Burning Equipment	●	●			
Sulfite Pulp Mills		●	●		
Kraft Mill			●		

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: ARIZONA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
All Sources	●	●			
Incinerators	●				
Fuel Burning Equipment	●	●		●	
Heater - Planers	●				
Sulfite Pulp	●	●			
Sulfuric Acid Plants		●			
Cement Plants		●			
Copper Smelters		●	●		
Nitric Acid Plants		■		●	

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: ARKANSAS AFFECTED FACILITY:	PARAMETER			
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x
Stationary Sources	● ●			
Process Equipment	●			
				CO ₂ /O ₂

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: CALIFORNIA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Refinery Boilers, New Cokers, Existing Boilers					● ●
Industrial Process		● ●			
Sulfuric Acid Plant		●	◆		
Fuel Burning Equipment		●		● ●	◆
Steam Generators	● ◆			●	
All Sources	●	● ●			
Sulfur Recovery		●	◆	◆	
Nitric Acid Plants				●	

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: COLORADO AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources					
Alfalfa Dehydration Plant	●	●			
Pilot Plants	●				
Coal and Oil Fired Operations	●				
National Gas Desulfurization		●			
Petroleum Refinery		●			
Shale Oil Production		●			
Shale Oil Refinery		●			
Sulfuric Acid Plant		●	●		
Process Unit		●			
Combustion Turbines		●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: CONNECTICUT AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Gas-Fired Fuel Burning Equipment	● 44			●	
Oil-Fired Fuel Burning Equipment	● 110			●	
Coal-Fired Fuel Burning Equipment (New)	● 12			●	
Coal-Fired Fuel Burning Equipment (Old)	● 12			●	
Stationary Gas Turbine				●	
Nitric Acid Plant				●	
Sulfuric Acid Plant		●	● 22		
Sulfur Recovery Plant			●		
Sulfite Pulp			● 11		
Other Process Sources	● 6		● 11		
Nonferrous Smelter (Copper)		●			

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: CONNECTICUT (Cont.) AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Nonferrous Smelter (Zinc)	●	●			
Nonferrous Smelter (Lead)	●	●			
Incinerators	■				
All Sources	■				

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: DELAWARE AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Nitric Acid Plant	● ◆				◆
All Facilities	● ◆				
Sewage Treatment Facility	●				
Sulfuric Acid Plant		● ◆			
Asphalt Concrete Plant	●				
Sulfur Recovery			● ◆		
Fuel Burning Equipment (New)		● ◆		● ◆	◆
Fuel Burning Equipment (Existing)	● ◆			● ◆	

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: DISTRICT OF COLUMBIA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Fossil Fueled Steam Generators	● ■	● ■		● ■	
Process Facilities					
All Sources					

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: FLORIDA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources	●				
Incinerator	●				
Sulfuric Acid Plant (New)	●	●	●		
Sulfuric Acid Plant (Existing)	●	●			
FFSG	●				
FFSG >250 MMBtu (New)		●		●	
FFSG >250 MMBtu (Existing)		●			
Nitric Acid Plant	●			●	
Carbonaceous Fuel Burning Equipment	●				
Sulfur Recovery Plant		●			
Kraft Pulp Mills			●		

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: GEORGIA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources					
Incinerators	●	●		●	
Fuel Burning Equipment	●	●		●	
Portland Cement Plant	●				
Nitric Acid Plant	●			●	
Sulfuric Acid Plant	●	●	●	●	
Conical Burners	●				

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: HAWAII AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Fossil Fuel-Fired Steam Generators All Sources	●	●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: IDAHO AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Orchard Heating Device	●				
Stationary Sources	●				
Wigwam Burners	●				
Fuel Burning		●	● ◆		
Kraft Pulp Mills					
Sulfuric Acid Plant - Burning Elemental Sulfur		●			
Zinc/Lead Smelters		● ◆			
NSPS					
FFPSG > 250 MM Btu	◆ ●	◆ ●		● ◆	
Portlant Cement Plant	●				
Nitric Acid Plant	●			● ◆	

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: IDAHO (Cont.) AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Sulfuric Acid Plant	●	●	●		
Petroleum Refinery	●	●	●		
Secondary Lead Smelter	●				
Secondary Brass and Bronze Ingot Production	●				
Municipal Sludge Incinerator	●				
Sulfite Pulp Mills	●	●	●		
Kraft Pulp Mills	●	●	●		

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: ILLINOIS AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Fuel Combustion Source	●	●			
Portland Cement Plant (New)	●				
Stationary Sources	●				
Process Emissions		●	●	●	
Coke Ovens	●				
Grain Handling Operation	●				
Nitric Acid Mfg.	●			●	
Sulfuric Acid Plants (New)		●			
H ₂ S Flare		●			
Petroleum and Petro-Chemical Processes FGD		●			
Sulfuric Acid Usage			●		

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: INDIANA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources	●			●	
Fuel Combustion Sources		●			
Sulfur Recovery Plants and All Other Sources		●			
FFPSG > 250 MM Btu	◆	◆			◆
Nitric Acid Plant > 300 TPD Acid				◆	
Sulfuric Acid Plant > 300 TPD Acid		◆			
Petroleum Refinery Catalyst Regenerator (> 20,000 bbls/day)	◆				

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: IOWA AFFECTED FACILITY:	PARAMETER			
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	HO _x
Fuel Burning Unit	●	●	●	
Sulfuric Acid Plant		◆	●	
All Facilities	●	●	●	
Incinerators	●			
Coal Fired Steam Generators	◆			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: KANSAS AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Indirect Heating Equipment	●				
Incinerators	●				
Processing of Materials	●				
Nonferrous Smelters (Zn, Pb)		●			
Process Gas Streams		●	●		
Indirect Heating Equipment (New)		●		●	

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: KENTUCKY AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Process Operations	●				
Indirect Heat Exchangers (>50 MMBtu)	●	●		●	
Indirect Heat Exchangers (>250 MMBtu)	●	●	◆	◆	
Portland Cement Plant	●				
Nitric Acid Plant	●			●	
Sulfuric Acid Plant	●	●	◆		
Asphalt Concrete Plant	●				
Petroleum Refineries	●	●	◆		◆
Secondary Lead Smelters	●				
Secondary Brass & Bronze Ingot Production	●				
Municipal Sludge Incinerators	●				
Sulfite Pulp Mills	●	●			

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: KENTUCKY (Continued) AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Kraft Pulp Mills	●		●		
Incinerators	●	●			
Indirect Heat Exchangers (>50 MMBtu/hr)	●	●			
Indirect Heat Exchangers (>250 MMBtu/hr)	●	●	●		
Process Operations	●				
Sulfuric Acid Plants	●	●	●		
Nitric Acid Plants	●			●	
Sulfite Pulp Mills		●			
Process Gas Stream		●	●		

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: LOUISIANA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Combustion Unit	●				
Safety Flares	●				
All Sources Except FCCU Incinerator-Waste Heat Boiler	●				
FCCU Incinerator-Waste Heat Boiler	●				
Chemical Woodpulp		●			
Sulfuric Acid Plant		●	●		
All Sources		●			
Nitric Acid Plants		●		●	
FFSG > 250 MM Btu/hr	◆	◆			◆
Sulfuric Acid Plant > 300 tpd		◆		◆	
Nitric Acid Plant > 300 tpd					
Cat. Cracker Regenerator > 20,000 bbls/day	◆				

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: MAINE AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Sulfite Pulping	●	●			
Incinerators	●				
All Sources	●				

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: MARYLAND AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
All Facilities	●				
Non-Fuel Burning Facility		●			
Coke Ovens	●	●			
Fuel Burning Equipment				● ●	
Nitric Acid Plant				●	

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: MASSACHUSETTS AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Fossil Fuel Facility	●	●		●	
Industrial Facilities		●		●	
Sulfuric Acid Plant		●			
Stationary Sources Other than Incinerator	●				
Incinerators	●				

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: MICHIGAN AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources Power Plants	●	●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: MINNESOTA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Indirect Heating Equipment	●	●			
Indirect Heating Equipment (New)				●	
Industrial Process Equipment	●				
Incinerator	●				
Stationary Sources	●				
Sulfuric Acid Plant		●	●		
Sulfuric Acid Plant (New)		●	●		
Nitric Acid Plant	●			●	
Portland Cement Plant	●			●	
Asphalt Concrete Plant	●				
Petroleum Refinery	●	●	●		
Secondary Lead Smelter	●				

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
STATE: MINNESOTA (Cont.) AFFECTED FACILITY:					
Secondary Brass and Bronze Ingot Production	●				
Municipal Sludge Incinerator	●				
Direct Heating Equipment	●	●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: MISSISSIPPI AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources	●	●	●		
Kraft Pulp Mills			●		
Sulfuric Acid Plants		●	●		
Sulfur Recovery Plants		●			
Copper, Zinc, Lead Smelters		●			
Fuel Burning Equipment		●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: MISSOURI AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources	●	●			
Incinerators	■				
Teepee Burners	●				
Process Sources	●				
Fuel Burning Equipment		● ●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: MONTANA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Incinerators	●				
Single Sources	●				
Stationary Sources	●				
Wood Waste Burner	●				
Primary Nonferrous Smelters - Cu, Pb, Zn		●			
Fuel Burning Equipment		●			
Gaseous Fuel Burning		●			
Kraft Pulp Mills			● ●		

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: NEBRASKA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
All Facilities	●				
Fossil Fueled Steam Generators	●		●		
Industrial Sources	◆				
Nitric Acid Plant				●	
Fossil Fuel Burning Equipment		●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: NEVADA AFFECTED FACILITY:	PARAMETER			
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x
Copper Smelters	●	●	●	
Petroleum Refineries	●	●	●	
Primary Nonferrous Smelters	●	●	●	
Primary Nonferrous Smelters (Copper)	●	●	●	
Fuel Burning Units	●	●	●	
Non-Fuel Burning Process	●	●	●	
Fossil Fuel-Fired Steam Generators	●	●	●	
Sulfuric Acid Plants	●	●	●	
All Sources	●	●	●	
Kiln	●	●	●	
Clinker Cooler	●	●	●	

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: NEVADA (Continued) AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
All New Sources	●				
Coal Preparation Plant	●				
Incinerators	●				
Nitric Acid Plant	●				
Asphalt Concrete Plant	●				
Secondary Lead Smelter	●				
Ferroalloy Production	●				
Secondary Brass & Bronze Plant	●				
Iron and Steel Plant	●				
Sewage Treatment Plants	●				
Primary Aluminum Reduction Plants	●				

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: NEW HAMPSHIRE AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Fuel Burning Equipment	●	●			
Steam Generators	●				
Incinerators	●				
Wood Waste Burner	●				
Asphalt Plant	●				
Kraft Pulp Mill		●	●		
Nonferrous Smelter (Copper)		●			
Nonferrous Smelter (Zinc)		●			
Nonferrous Smelter (Lead)		●			
Secondary Lead Smelters	●	●			
Brass and Bronze Ingot Production	●				

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: NEW JERSEY AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Fossil Fuel Burning Unit (Coal)		●			
Sulfur Recovery		●			
All Sources			●		
Indirect Heat Exchanger	●				
Incinerators	●				

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: NEW MEXICO AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources	●				
Wood Waste Burner	●				
Nonferrous Smelter	●		●		
Petroleum Processing Facility (Existing)	●	●	●		
Coal Fired Boilers > 250 MM Btu		◆		●	◆
Oil Burning Equipment		●		●	
Gas Burning Equipment		●		●	
Gasification Plant		●			
Kraft Pulp Mill			●		
Natural Gas Processing			●		
Petroleum Refinery (New)			●		
Petroleum Refinery (All)		●	●		

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

REGION VI - EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: NEW MEXICO (Cont.) AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Hydrocarbon Storage			●		
Sulfur Recovery Plant			●		
Sulfuric Acid Plant			●		

 EMISSION STANDARD FOR PARTICULAR CATEGORY
 DETAILED CONTINUOUS MONITORING REGULATIONS
 GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: NEW YORK AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
By Produce Coke Oven Batteries	●	●			
Incinerators	●				
Portland Cement Process	■				
Portland Cement Kiln or Clinker Cooler	■				
Nitric Acid Plant	●			● ◆	
Sulfuric Acid Plant	●	● ◆	● ◆	● ◆	
Stationary Combustion Installations	■				
Petroleum Refineries			●		
All Sources	●				

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: NORTH CAROLINA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources	●				
Lightweight Aggregate Processes - Kilns		●			
Fuel Burning Installations		●			
Sulfuric Acid Plants		●	●		
Sulfuric Acid Plants (Chamber Process)				●	
Boilers >250 MMBtu				●	
Nitric Acid Plants				●	

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: OHIO AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources	●				
Process Equipment		●			
Sulfuric Acid Plant		●	●		
Sulfur Recovery Plant		●			
Smelters (Cu, Zn, Pb)		●			
Sulfite Pulp Mill		●			
Fuel Burning Installation		●			
Process Gas Stream		●			
Nitric Acid Plant		●	●	● ●	
Combustion Sources > 250 MM Btu					

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: OKLAHOMA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Incinerator	●				
Stationary Sources	●				
Sulfuric Acid Plant	●	●	●		
Fuel Burning Equipment > 250 MM Btu	◆	◆			◆
Fuel Burning Equipment > 50 MM Btu (New)				●	
Fuel Burning Equipment (New)		◆			
Nitric Acid Plant (New)	●	●		●	
Petroleum and Natural Gas Processes (New)			●		
Petroleum Refineries	◆	●			
Sulfur Recovery Plant (New)		●	◆		
Nonferrous Smelters (New)		●	◆		
Paper Pulp Mill (New)		●	◆		

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

REGION X - EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: OREGON AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources					
Wigwam Wood Waste Burner	●				
Kraft Pulp Mill	●	●	●		
Primary Aluminum Plant	●				
Veneer Dryers	●				
Laterite Ore Production of Ferronickel	●				
Fuel Burning Equipment		●			
Sulfite Pulp Mill > 110 ton/day		●	●		

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: PENNSYLVANIA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
All Facilities	●	●			
By Product Coke Ovens		●	●		
Combustion Units		●			
Primary Zinc Smelters		●			

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: PUERTO RICO AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary sources	●				
Fuel burning equipment		●			
Process gas stream		●			
Sulfuric acid plant		●			
Sulfur recovery plant		●			
Primary nonferrous smelters		●			
Sulfite pulp mill		●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: RHODE ISLAND AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
All Facilities Fossil Fuel Fired Steam or Hot Water Generators	● ◆				

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: SOUTH CAROLINA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources					
FFSG >250 MMBtu	●				
Incinerators	◆				
Fuel Burning Sources	●	●			
Sulfuric Acid Plants	●	●	●		

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
- GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: SOUTH DAKOTA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources	●				
Wood Waste Burner	●				
Incinerator	●				
Fuel Burning Equipment		●			
NSPS					
FFSG > 250MM Btu	●	●			
Portland Cement Plant	●				
Nitric Acid Plant	●				
Sulfuric Acid Plant	●	●	●		
Asphalt Concrete Plant	●				
Petroleum Refinery	●	●			
Secondary Lead Smelter	●				

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: TENNESSEE AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
All air contaminant sources	●				
Certain existing sources	◆				
Fuel burning installation	●	●			
Air contaminant source	●	●			
Sulfuric acid plant			●		
New air contaminant Sources > 250 MM Btu/hr				●	
Nitric acid plant				●	
FFPSG > 250 MM Btu	◆	◆			◆
Sulfuric acid plants > 300 tpd	◆	◆			
Petroleum refinery Cat. cracker regenerator > 20,000 bbls/day	◆				

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: TEXAS AFFECTED FACILITY:	PARAMETER			
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x
Stationary Flue	●			
Stationary Flue (> 100,000 acfm)	●			
Waste Gas Flare	●			
Sulfuric Acid Plant		●		
Sulfur Recovery Plant		●		
Nonferrous Smelters		●		
FFPSG		●		
Primary Copper Smelter		●		
Primary Zinc Smelter		●		
Primary Lead Smelter		●		
Other Primary Smelter		●		

 EMISSION STANDARD FOR PARTICULAR CATEGORY
 DETAILED CONTINUOUS MONITORING REGULATIONS
 GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
STATE: TEXAS (Cont.) AFFECTED FACILITY: Secondary Metal Recovery FFPSG > 600 M lb/hr. Steam Nitric Acid Plant Sulfuric Acid Plants (As SO ₂ Control in Nonferrous Smelter)		●		● ●	
		●			

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: UTAH AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources (Existing)	●				
Stationary Sources (New)	●	●			
Diesel and Internal Combustion	●				
Nonferrous Smelter		●			
Fuel Burning Equipment		●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: VERMONT AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Combustions Installations All Facilities	●	●		●	

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: VIRGINIA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Fossil Fuel Fired Steam Generators	●	●		◆	◆
Catalyst Regenerators for Fluid Bed Catalytic Cracking Regenerators	◆				
All Sources	●				
By Product Coke Ovens	●				
Sulfuric Acid Plant		●	●		
Combustion Installation		●			
Sulfur Recovery Plant		●			
Lightweight Aggregate		●			
Nonferrous Smelters		●			
Petroleum Refineries; Fuel Gas Combustion Device		◆			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: VIRGINIA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Nitric Acid Plant Process Gas Streams Kraft Pulp Mills			● ●	● ●	

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: VIRGIN ISLANDS AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Existing sources	●				
New sources	●				
Fuel oil combustion		●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: WASHINGTON AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Primary Aluminum Plants	●				
Stationary Sources	●	●			
Log Fuel Boilers	●				
Catalytic Cracker	●				
Kraft Pulping Mills	●		●		
Sulfite Pulping Mills	■		◆		
FFSG > 250 MM Btu	●	●			
Sulfuric Acid Plant > 300 TPD Acid	◆	◆			
Catalytic Cracker Regenerator > 20,000 bbls/day	◆	◆			
Wood Residue FSG > 100 MM Btu/hr	■				◆

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: WEST VIRGINIA AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
All Facilities	●				
Incinerators	●				
Hot Mix Asphalt Plant	●				
Refinery Process Gas Stream			●		
Fuel Burning Facility		●			
Manufacturing Process		●			
Sulfuric Acid Plant		●			
Sulfur Recovery Plant		●			
Nonferrous Smelter		●			
Sulfite Pulp Mill		●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: WISCONSIN AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources	●				
Asphalt Concrete Plant	●				
Petroleum Refinery	●	●	●		
Lead Smelters	●				
Brass and Bronze Ingot Production	●				
Municipal Sludge Incinerator	●				
FFFG > 250 MM Btu/hr. (New)		●		●	
Sulfuric Acid Plant (New)		●			
Kraft Pulp Mills			●		
Gasoline and Diesel Engine				●	
Nitric Acid Plant (New)	●				

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

STATE: WYOMING AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Stationary Sources (New)	●				
Stationary Sources (Existing) (Except Incinerators)	●				
Fuel Burning Equipment (New) Used for Indirect Heating	●				
Incinerators	●				
Wood Waste Burners	●				
Sulfuric Acid Plant	●	●	●		
Fuel Burning Equipment		●		●	
Nitric Acid Plant		●		●	
Diesel Engines	●				

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

STATE: ALLEGHENY COUNTY AFFECTED FACILITY:	PARAMETER			
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x
All sources	45	42		
Incinerators	45			
Coke ovens	45			
Blast furnace slips	45			
Fuel-burning or combustion equipment		42		
Sulfuric acid plant		42	45	
Sulfur recovery plant		42	45	
By-product coke - oven gas			45	

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

STATE: BAY AREA APCD SAN FRANCISCO AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
All sources	●	●			
Incinerators	●	●			
All heat transfer op.	●	●			
New heat transfer op. (4/19/72) > 250 MM Btu/hr				●	
All heat transfer op. > 1,750 MM Btu/hr				●	
General combustion and operations	●	●			
Sulfuric acid plant			●		
Sulfur production			●		
Sulfur manufacturing > 100 tpd SO ₂		●			
Fuel burning - solid or liquid fuel		●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

STATE: BAY AREA APCD SAN FRANCISCO (Cont.) AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Dimethylsulfide source			48		
Mercaptan source			24		
Kraft Pulp Mill			9		
FFSG > 250 MM Btu/hr	10	40	14	10	10
CO boiler - FBCC regenerator	10	40			
CO boiler - fluid coker regenerator > 10,000 bbl/day	10	40			
Sulfur recovery plant > 100 tpd of SO ₂ (New 11/3/76)	10	40			
Sulfuric acid plant		40			
Nitric acid plant (New 9/7/77)				10	
Nitric acid plant (Existing 9/7/77) > 300 tpd				10	

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

AGENCY: BOSTON AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Fuel Burning Equipment All Sources	●	●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

AGENCY: CHICAGO AFFECTED FACILITY:	PARAMETER			
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x
Stationary Sources	●	●●	●	
Space Heating Equipment		●●		
Industrial Processes and Power Plants		●●		
Electrical Generating		●		
				CO ₂ /O ₂

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

AGENCY: DADE COUNTY AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
All Sources Fossil Fuel-Fired Steam Generators	●	● ● ■			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

AGENCY: DENVER AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
All Sources	●	●			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

STATE: JEFFERSON COUNTY AFFECTED FACILITY:	PARAMETER			
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x
Process operations	●			
Indirect, heat exchanger	●	●		●
Waterwall spreader-stoker heat exchanger	●			
All other waterwall indirect heat exchanger	●			
Incinerators	●			
Process gas stream		●	●	
Indirect heat exchangers > 250 MM Btu/hr		●		
Nitric acid plant > 300 tpd	◆	◆		◆
Sulfuric acid plant > 300 tpd		◆		◆
Petroleum refinery Cat. cracker regenerator > 20,000 bbls/day	◆			

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

	PARAMETER			
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x
AGENCY: PHILADELPHIA				
AFFECTED FACILITY:				
All Sources Except Incinerators	●			
Nitric Acid Plants	●			●
Incinerators	●			
All Sources		●	●	
Fuel Burning Equipment				●

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

AGENCY: PUGET SOUND AIR POLLUTION CONTROL AGENCY AFFECTED FACILITY:	PARAMETER			
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x CO ₂ /O ₂
All Sources	●	●		

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
AGENCY: ST. LOUIS					
AFFECTED FACILITY:					
Fuel Burning Equipment	●	●			
All Sources	●		●		
Incinerators	●				

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

STATE: SOUTH COAST AQMD LOS ANGELES AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Emission source	●				
Coke ovens	●				
Natural gas combustion		●			
Process gas combustion		●			
Liquid fuel combustion		●			
Electric power plant-steam generators		●			
Electric power plant generating equipment (New 5/7/76) > 50 MM Btu/hr				●	
Sulfur recovery unit		●	●		
Sulfuric acid units		●	●		
Solid fossil fuel combustion		●	●		
Fuel burning equipment > 555 MM Btu/hr		●		●	

- EMISSION STANDARD FOR PARTICULAR CATEGORY
- ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
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EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

STATE: SOUTH COAST AQMD LOS ANGELES (Cont.) AFFECTED FACILITY:	PARAMETER				
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x	CO ₂ /O ₂
Steam generating equipment > 555 MM Btu/hr				●	
Steam generating equipment (New 5/7/76) > 50 MM Btu/hr				●	
Steam generators > 250 MM Btu/hr		◆		◆	◆
Nitric Acid Plant (New 10/1/78)				◆	
Nitric acid plant (Existing 10/1/78 > 300 tpd)				◆	
CO boilers - FCCM regenerators		◆			
Fluid cokers > 10,000 bbls/day		◆			

● EMISSION STANDARD FOR PARTICULAR CATEGORY
 ◆ DETAILED CONTINUOUS MONITORING REGULATIONS
 ■ GENERAL CONTINUOUS MONITORING REGULATIONS

EMISSIONS STANDARD AND CONTINUOUS MONITORING SUMMARY

LOCAL

AGENCY: WAYNE COUNTY AFFECTED FACILITY:	PARAMETER			
	OPACITY	SO ₂	SULFUR COMPOUNDS OTHER THAN SO ₂	NO _x
All Sources Electric Power Plants and Steam Generators Residential Space and Water Heating Sulfuric Acid Plants Sulfur Recovery Petroleum Refinery	● ■	● ■		
		● ■		
		● ■		
		● ■	● ■	
		● ■	● ■	
		● ■	● ■	

- EMISSION STANDARD FOR PARTICULAR CATEGORY
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OPACITY

- o Fossil fuel-fired steam generators (FFFSG)
- o Portland cement plants
- o Catalyst regenerators of fluid bed catalytic cracking units (FBCCU)
- o Wood fuel-fired boilers
- o Kraft recovery furnaces
- o Basic oxygen process furnaces (BOPF)
- o Ferroalloy electric submerged arc furnaces

<u>NO_x</u>	<u>SO₂</u>
o FFFSG	o FFFSG
o Nitric acid plants	o Sulfuric acid plants
	o Smelters

The report is organized into a separate Executive Summary and three volumes. The first volume contains an analysis of state adopted emission standards for opacity, SO₂, NO_x, malfunctions and scheduled maintenance², and^x continuous monitoring regulations for existing stationary sources. Volume II provides a tabular summary of key components of the applicable emission standards and regulations including source category, minimum source capacity, averaging time of standard, exemptions, etc. Volume III of the report contains the complete text of the regulations cited.

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